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RPP-RPT-58329
Revision 3

Risk Assessment of Contaminated Soils and Vadose Zone Sediments at Waste Management Area C at the Hanford Site, Southeast Washington

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Rev. 1	26-Sept-2016	M. Rahman	Updated to respond to review comments by Ecology on Rev. 0 and review comments by WRPS and DOE-ORP of updated report. Also included expanded analysis of groundwater protection using site-specific flow and transport modeling (see section 3.5.11 and Appendix F).
Rev. 2	31-Oct-2016	M. Rahman	Executive Summary, Section 3.5.11 and Section 5.2 updated to reflect changes in RPP-RPT-59197, Analysis of Past Tank Waste Leaks and Losses in the Vicinity of Waste Management Area C at the Hanford Site, Southeast Washington, Rev. 1 based on new results from future projected simulations of tritium and cobalt-60 inventories.
Rev. 3	12-Jan-2021	M. Rahman	Updates to Rev. 2 in response to review comments provided by Washington State Department of Ecology and additional review comments from WRPS and DOE-ORP.

EXECUTIVE SUMMARY

This risk assessment (RA) report presents the potential health impacts to human and ecological receptors from exposure to both nonradiological and radiological contaminants present in the soil and shallow vadose zone sediment beneath Waste Management Area (WMA) C. Past operations at the Site have resulted in releases of chemicals and radionuclides to soil and vadose zone sediment that may pose risks to human and ecological receptors. The RA is developed in support of the Phase 2 *Resource Conservation and Recovery Act of 1976* (RCRA) facility investigation (RFI).

Soil sampling results collected from 13 judgment-based sampling locations (A, B, C, E, F, G, H, I, J, L1/L2, P, R, and U) were validated, evaluated and segregated into 10 exposure areas or EAs (A+B, C, E, F+G, H+I, J, L1+L2, P, R, and U). Two screening steps – a data reduction screen and a weight of evidence screen – were performed to identify contaminants of potential concern (COPCs) for both human and ecological receptors at each EA. These COPCs were evaluated in both the human health risk assessment (HHRA) and the screening level ecological risk assessment (SLERA).

Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for the COPCs. However, due to the presence of extensive amounts of interferences caused by buried infrastructure and topographic constraints, a sample-by-sample approach was used to calculate the source-term concentration. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the Interagency Management Integration Team (IAMIT) Determination 2019-006, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Judgmental Sample Analysis*, an additional HHRA was performed for four exposure scenarios and the groundwater protection evaluation using a sample-by-sample approach. In addition, three supplemental RAs were conducted to support the Corrective Measures Study alternatives evaluation process as documented in RPP-RPT-59397, *Waste Management Area C Phase 2 Corrective Measures Study Report*.

Initial HHRA was performed using a statistical approach to calculate the source-term concentrations or exposure point concentrations for both radiological and nonradiological COPCs. Under this approach, HHRA addresses potential exposures to industrial worker, construction worker, maintenance/surveillance worker, trespasser, hypothetical onsite residential receptors and two Native American residential receptors. The potential exposures of these receptors to nonradiological and radiological COPCs detected in shallow vadose soils were evaluated for various exposure pathways. The U.S. Environmental Protection Agency (EPA) software ProUCL 4.00.05 was used to determine the exposure point concentration for each COPC within each of the EAs.

The EPA's Risk Assessment Guidance for Superfund and modified *Washington Administrative Code* (WAC) *Model Toxics Control Act* (MTCA) human health risk equations were used to perform risk assessment for nonradiological COPCs. The RESidual RADioactivity computer code (version 6.5) was used to perform the radiological risk assessment for all exposure scenarios from contamination that is present in the soil.

The results of both nonradiological and radiological risk assessments for each EA were then compared against corresponding acceptable risk criteria established by Federal and State regulatory agencies. The results are summarized below.

For industrial worker and maintenance/surveillance worker, the total excess lifetime cancer risks (ELCRs) for five EAs (A+B, C, E, L1+L2 and P) are greater than the EPA upper risk threshold of 1×10^{-4}. For trespasser youth, the total ELCRs for EAs A+B and C are greater than the EPA upper risk threshold of 1×10^{-4}. For these three exposure scenarios, the two major risk contributors, ^{137}Cs and ^{126}Sn, are retained as radiological COPCs warranting further evaluation in the Corrective Measures Study. For the residential scenario, except for EA R, the total ELCRs for all EAs are greater than the EPA upper risk threshold of 1×10^{-4}. Cesium-137, ^{60}Co, ^{63}Ni, ^{79}Se, ^{90}Sr ^{126}Sn and ^{99}Tc were identified as major residential receptor risk contributors at various EAs. Nonradiological COPCs were not identified as major hazard contributors for any EA within WMA C.

An HHRA was also performed using a sample-by-sample approach for both radiological and nonradiological COPCs due to the biased (judgmental) nature of the soil sampling. The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) industrial worker and CERCLA residential receptor scenarios were evaluated for radiological COPCs. WAC industrial worker and WAC residential receptor scenarios were evaluated for nonradiological COPCs.

For the CERCLA industrial worker scenario, the carcinogenic risks based on a statistical approach for eight of the EAs are either more conservative or equal when compared to their corresponding carcinogenic risks based on a sample-by sample approach. For EA H+I and EA P, the carcinogenic risks based on a sample-by-sample approach are more conservative than their corresponding ELCRs based on a statistical approach. For EA P, the calculated risk using both methods resulted in an unacceptable risk. For the CERLCA residential scenario, the carcinogenic risks based on a statistical approach are more conservative when compared to their corresponding sample-specific carcinogenic risks for nine EAs. For EA P, the maximum sample-specific carcinogenic risk (3×10^{-3}) is more conservative than the carcinogenic risk (2×10^{-3}) based on EA-specific exposure point concentrations. It should be noted that calculated risk using both methods resulted in unacceptable risk at EA P.

Based on the WAC industrial worker and WAC residential receptor risk evaluation results for ten EAs, the carcinogenic risks based on a sample-by-sample approach for five EAs (A+B, F+G, H+I, L1+L2 and P) are slightly higher than the corresponding carcinogenic risks based on a statistical approach. It should be noted that calculated carcinogenic risks for those five EAs using both methods did not result in unacceptable risk.

For the WAC industrial worker scenario, the non-cancer hazards based on a statistical approach for two EAs (H+I and J) are slightly higher than the corresponding non-cancer hazards based on a sample-by-sample approach. It should also be noted that calculated HIs for all EAs using both methods were less than the EPA and MTCA target HI of 1. For the WAC residential receptor scenario, the non-cancer hazards based on a sample-by-sample approach for two EAs (A+B and L1+L2) are slightly higher than their corresponding non-cancer hazards based on a statistical

approach. It should also be noted that calculated HIs using both methods were greater than the EPA and MTCA target HI of 1.

Three supplemental RAs—(1) supplemental HHRA for exposure areas; (2) supplemental HHRA for unplanned releases; and (3) supplemental HHRA for past leaks, surface releases and French drain—were conducted to support the Corrective Measures Study alternatives evaluation. They are briefly summarized below.

(1) During the first supplemental HHRA, a radiological RA was performed for the CERCLA industrial worker scenario to determine the impacts of a 4-in. barrier with respect to the total risk for each EA. The result showed that the maximum carcinogenic risk for each EA evaluated is within or less than EPA's acceptable target risk range.

(2) Supplemental HHRAs were conducted for both radiological and nonradiological COPCs present at three unplanned release (UPR) locations within WMA C: 200-E-81 (UPR-81), 200-E-82 (UPR-82), and 200-E-86 (UPR-86). Radiological risks are estimated with no soil cover and with a 3-ft concrete cover in place for the CERCLA industrial worker exposure scenario. The results showed that the carcinogenic risks for all UPRs with no cover are greater than EPA's threshold risk of 10^{-4}. The carcinogenic risks for all UPRs with a 3-ft concrete cover are within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6}. A nonradiological RA was conducted for each UPR for a CERCLA industrial worker scenario, and an adult WAC industrial worker receptor scenario based on MTCA Method C Standard. The results of nonradiological RA did not identify nonradiological risk contributors and non-cancer hazard contributors.

(3) Supplemental human health radiological dose and risk assessments were performed for a CERCLA construction worker scenario for the radionuclide soil contamination associated with past leaks originating from six single-shell tanks (241-C-101, 241-C-104, 241-C-105, 241-C-108, 241-C-110, and 241-C-112) with no cover. The results showed that the maximum carcinogenic risk for all six past tank leaks is greater than EPA's acceptable target risk range and the maximum doses for all six past tank leaks are greater than 500 mrem/yr. The past leaks were estimated to have occurred at least 20 ft below ground surface. There are no complete direct exposure pathways for both radiological and nonradiological contaminants associated with the past tank leaks. Hence, both radiological and nonradiological risk assessment was not performed.

Supplemental HHRAs were performed for the soil contamination associated with surface releases within WMA C based on the CERCLA industrial worker exposure scenario, assuming no soil cover. The radiological ELCR for surface releases is less than EPA's target risk threshold of 10^{-4}. No nonradiological risk and hazard contributors were identified for the surface releases.

Supplemental HHRA were performed based on the CERCLA industrial worker scenario for the soil contamination associated with past discharges to the 216-C-8 French drain by assuming no cover condition and a 0.1-m (4-in.) concrete cover condition. Under no cover condition, the radiological ELCR for all UPRs is greater than EPA's target risk

threshold of 10^{-4}. Under a 0.1-m concrete cover condition, the radiological ELCR is within EPA's acceptable target risk range of 10^{-4} to 10^{-6}. No nonradiological risk and hazard contributors were identified.

The SLERA for WMA C was prepared primarily in accordance with the framework developed using the tiered process outlined in CHPRC-00784, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site* and CHPRC-01311, *Tier 2 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*. Generic screening and Tier 1 screening were performed for both radiological and nonradiological contaminants present in the soil. Because risk-based values for ecological protection developed in these documents include both No-Observed-Adverse-Effect-Levels (NOAELs) and Lowest-Observed-Adverse-Effects-Level (LOAELs), two Tier 1 screens were conducted using each type of value (i.e., NOAEL, LOAEL). Only nonradiological contaminants remaining following the Tier 1 screens were retained for Tier 2 SLERA. The Tier 2 SLERA was performed using Tier 2 screening values for plants and soil invertebrates to assess the potential for ecological risk resulting from exposure to nonradiological (only) COPCs present in the soil at WMA C.

The results of the Tier 1 nonradiological screenings indicate that the maximum detected concentrations for cadmium within EAs E and R and vanadium and zinc within EA P exceed the acceptable risk criteria (hazard quotient of 1). These three metals were retained for further evaluation in the Tier 2 SLERA. The results of the Tier 1 screening for radiological COPECs identified a potential for ecological risk (sum of the fractions > 1) at EA P (only). Among all radiological COPECs at this EA, ^{90}Sr, ^{3}H and ^{137}Cs contributed more than 99% of the risk and were retained as radiological COPECs for EA P.

The results of the Tier 2 evaluation showed that the hazard quotients for six COPECs (boron, molybdenum, selenium, thallium, sulfate and Bis [2-ethylhexyl] phthalate) are greater than 1. Those nonradiological COPECs were retained for the site.

Supplemental ecological risk assessments were performed for three UPRs, surface contamination associated with releases and activities within the 241-C Tank Farm, and the 216-C-8 French drain to assess the potential for ecological impacts resulting from biota exposure to radiological and nonradiological COPCs present in the soil. No assessment was performed for six past leak locations as peak leaks occurred at a minimum depth of 20 ft below ground surface. The results showed that the sum of the fractions for the three UPRs and the 216-C-8 French drain are greater than 1 with ^{14}C, ^{137}Cs, ^{154}Eu (UPR-82 only), and ^{90}Sr considered as the major dose contributors. The results also showed that among nonradiological COPCs, the hazard quotient for nickel only slightly exceeded its respective Soil Benchmark at UPR-81 (i.e., indicating a potential for ecological risk), while the hazard quotient values for all other nonradiological constituents at UPR-82 and UPR-86 are less than 1 (i.e., indicating negligible risk potential). However, the exceedances for radiological and nonradiological COPCs are considered of little significance for current and future vegetation exposure because the UPR and surrounding areas within and around WMA C are paved and any vegetation is (currently) managed using herbicide applications. In support of the Corrective Measures Study process, several remedial alternatives such as isolation barriers and/or infiltration barriers are being considered to minimize the risk

associated with the elevated radiological contaminants within those UPRs. The proposed alternative would prevent the exposure of the radiological contaminant for wildlife receptors.

Assessments referred to as the “protection of groundwater pathway” were performed based on a statistical based approach and a sample-by-sample approach as part of the WMA C RA to understand the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer. Soil samples collected from both shallow zone (0 to 15 ft below ground surface) and deep vadose zone (>15 ft below ground surface) were utilized to perform the assessment for protection of groundwater pathway. The results of the protection of groundwater pathway assessment based on a statistical approach retained two COPCs (cadmium and beta-BHC) for the protection of groundwater assessment. The results of the protection of groundwater pathway assessment based on a sample-by-sample approach retained five COPCs (arsenic, cadmium, hexavalent chromium, thallium and beta-BHC) for the protection of groundwater assessment. It should be noted that hexavalent chromium was not measured during site characterization. The reported sample results for total chromium were assumed to be present only as hexavalent chromium during the data evaluation. Additionally, screening value for thallium was used for screening purposes and should not be used as cleanup level.

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TABLE OF CONTENTS

PREFACE 1-1

1.0 INTRODUCTION 1-1

1.1 SCOPE AND OBJECTIVES OF THE RISK ASSESSMENT 1-2

1.2 RISK ASSESSMENT APPROACH 1-4

1.3 REPORT ORGANIZATION 1-5

2.0 DATA COLLECTION AND EVALUATION 2-1

2.1 COLLECTION OF SOIL SAMPLES 2-1

2.2 VALIDATION AND ANALYSIS OF SOIL SAMPLING RESULTS 2-2

2.3 DATA EVALUATIONS 2-4

2.3.1 Data Evaluation for Analytes Reported by Numerous Analytical Methods 2-4

2.3.2 Data Evaluation for Samples with Field Duplicate Results 2-5

2.4 IDENTIFY EXPOSURE AREA-SPECIFIC DATA SETS 2-5

2.5 IDENTIFY EXPOSURE-SPECIFIC DATA SET FOR EACH EXPOSURE AREA 2-5

3.0 HUMAN HEALTH RISK ASSESSMENT 3-1

3.1 HUMAN HEALTH RISK ASSESSMENT USING STATISTICAL APPROACH 3-2

3.1.1 Identification of Contaminants of Potential Concern for Each Exposure Area 3-3

3.1.2 Exposure Assessment 3-7

3.1.3 Toxicity Assessment 3-46

3.1.4 Risk Characterization Methods 3-49

3.1.5 Results of Risk Characterization 3-54

3.1.6 Groundwater Protection Pathway 3-79

3.2 HUMAN HEALTH RISK ASSESSMENT BASED ON SAMPLE BY SAMPLE APPROACH 3-107

3.2.1 Radiological Human Health Risk Evaluations for the CERCLA Industrial and Residential Scenarios 3-107

3.2.2 Nonradiological Human Health Risk Evaluations for the WAC Industrial Worker and WAC Residential Scenarios 3-137

3.2.3 MTCA Groundwater Protection Scenario for Nonradiological Contaminants Using the Fixed-Parameter Three-Phase Model 3-226

3.3 SUPPLEMENTAL HUMAN HEALTH RISK ASSESSMENT 3-229

3.3.1 Supplemental Human Health Risk Assessment for Exposure Areas ... 3-230

3.3.2 Supplemental Human Health Risk Assessment for Unplanned Releases 3-231

3.3.3 Supplemental Human Health Risk Assessment for Past Tank Leaks, Surface Releases and 216-C-8 French Drains 3-234

3.4 UNCERTAINTIES IN RISK ASSESSMENT 3-238

3.4.1 Uncertainties Associated with Analytical Data 3-240

3.4.2 Uncertainties Associated with Exposure Assumptions 3-241

3.4.3 Uncertainties Associated with Toxicity Assessment 3-243

3.4.4 Uncertainties Associated with Risk Characterization 3-245

4.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT 4-1

4.1 CHARACTERIZATION OF ECOLOGICAL SETTING 4-3

4.2 SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN 4-5

4.2.1 Data Reduction Screen 4-5

4.2.2 Analytical Detection Screen 4-5

4.3 GENERIC SCREENING PROCESS 4-5

4.4 TIER 1 SCREENING ASSESSMENT 4-10

4.4.1 Determination of Tier 1 Soil Screening Level 4-12

4.4.2 Tier 1 Screening Results 4-19

4.5 TIER 2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT 4-19

4.5.1 Determination of Tier 2 Soil Screening Level 4-22

4.5.2 Tier 2 Screening Level Ecological Risk Assessment Methodology 4-23

4.5.3 Results of Tier 2 Screening Level Ecological Risk Assessment 4-23

4.6 SUPPLEMENTAL ECOLOGICAL RISK ASSESSMENT 4-27

4.7 UNCERTAINTIES ASSOCIATED WITH THE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT 4-30

5.0 SUMMARY AND CONCLUSIONS 5-1

5.1 RESULTS OF HUMAN HEALTH RISK ASSESSMENT 5-1

5.2 RESULTS OF GROUNDWATER PROTECTION ANALYSIS 5-4

5.3 RESULTS OF SCREENING LEVEL ECOLOGICIAL RISK ASSESSMENT 5-4

6.0 REFERENCES 6-1

LIST OF APPENDICES

APPENDIX A: Assigned Values for Exposure Parameters

Attachment A-1: Assigned Values for Exposure Parameters during Nonradiological Risk Assessment
Attachment A-2: Assigned Values for Exposure Parameters Used In RESRAD Model

APPENDIX B: Toxicological and Physical Properties for Nonradiological and Radiological COPCs

Attachment B-1: Toxicological and Physical Properties for Nonradiological COPCs
Attachment B-2: Dose Conversion Factors and Risk Coefficients for Radiological COPCs

APPENDIX C: Intake and Risk Assessment Summary Report for Nonradiological COPCs

Attachment C-1: Results of Nonradiological Risk Assessment under Industrial Worker Scenario
Attachment C-2: Results of Nonradiological Risk Assessment under Industrial Worker Scenario based on MTCA Method B Standard
Attachment C-3: Results of Nonradiological Risk Assessment under Construction Worker Scenario
Attachment C-4: Results of Nonradiological Risk Assessment under Maintenance/ Surveillance Worker Scenario
Attachment C-5: Results of Nonradiological Risk Assessment under Adult Trespasser Receptor Scenario
Attachment C-6: Results of Nonradiological Risk Assessment under Trespasser Youth Receptor Scenario
Attachment C-7: Results of Nonradiological Risk Assessment under Residential Adult Receptor Scenario
Attachment C-8: Results of Nonradiological Risk Assessment under Child Residential Receptor Scenario
Attachment C-9: Results of Nonradiological Risk Assessment under Residential Receptor Scenario based on MTCA Method B Standard
Attachment C-10: Results of Nonradiological Risk Assessment under CTUIR Residential Adult Receptor Scenario
Attachment C-11: Results of Nonradiological Risk Assessment under CTUIR Residential Child Receptor Scenario
Attachment C-12: Results of Nonradiological Risk Assessment under Yakama Residential Adult Receptor Scenario
Attachment C-13: Results of Nonradiological Risk Assessment under Yakama Residential Child Receptor Scenario

APPENDIX D: Radiological Dose and Risk Assessment Summary Report

Attachment D-1: Results of Radiological Risk Assessment for CERCLA Industrial Worker

Attachment D-2: Results of Radiological Risk Assessment for CERCLA Construction Worker
Attachment D-3: Results of Radiological Risk Assessment for CERCLA Maintenance/Surveillance Worker
Attachment D-4: Results of Radiological Risk Assessment for CERCLA Adult Trespasser Receptor
Attachment D-5: Results of Radiological Risk Assessment for CERCLA Youth Trespasser Receptor
Attachment D-6: Results of Radiological Risk Assessment for CERCLA Residential Receptor
Attachment D-7: Results of Radiological Risk Assessment for CTUIR Residential Receptor
Attachment D-8: Results of Radiological Risk Assessment for Yakama Residential Receptor

APPENDIX E: Results of SLERA

Attachment E-1: Results of SLERA for Nonradiological COPECs
Attachment E-2: Results of SLERA for Radiological COPECs

APPENDIX F: Direct Exposure Radiological Risk Evaluations Using Sample-By-Sample Approach

Attachment F-1: Sample Results for Radiological Contaminants
Attachment F-2: Radiological Risk Assessment Results under CERCLA Industrial Worker Scenario
Attachment F-3: Radiological Risk Assessment Results under CERCLA Residential Receptor Scenario

APPENDIX G: Direct Contact Nonradiological Risk and Hazard Evaluations Using Sample-By-Sample Approach

Attachment G-1: Sample Results for Nonradiological Contaminants
Attachment G-2: Nonradiological Risk Evaluation Results for Washington Administrative Code Industrial Worker
Attachment G-3: Nonradiological Risk Evaluation Results for Washington Administrative Code Residential Receptor
Attachment G-4: Nonradiological Hazard Evaluation Results for Washington Administrative Code Industrial Worker
Attachment G-5: Nonradiological Hazard Evaluation Results for Washington Administrative Code Residential Receptor

APPENDIX H: Protection of Groundwater Assessment Using Sample-By-Sample Approach

APPENDIX I: WMA C EPC Differences between using ProUCL v4.00.05 and ProUCL v5.1

APPENDIX J: Review Comment Record – RPP-RPT-58329, *Baseline Risk Assessment for Waste Management Area C*, Rev. 2

LIST OF FIGURES

Figure 1-1. Single-Shell Tanks and Related Facilities in Waste Management Area C 1-3

Figure 2-1. Final Sampling Locations with Respect to Physical Features 2-3

Figure 2-2. Exposure Areas within Waste Management Area C 2-7

Figure 3-1. Human Health Conceptual Site Model for Soil Contamination within Waste Management Area C 3-9

Figure 3-2. Exposure Areas with Unacceptable Risks under CERCLA Industrial Worker Scenario 3-56

Figure 3-3. Exposure Areas with Unacceptable Risks under CERCLA Maintenance/Surveillance Worker Scenario 3-61

Figure 3-4. Exposure Areas with Unacceptable Risks under CERCLA Trespasser Youth Receptor Scenario 3-65

Figure 3-5. Exposure Areas with Unacceptable Risks under CERCLA Residential Receptor Scenario 3-68

Figure 4-1. Conceptual Ecological Conceptual Site Model for Hanford Site Terrestrial Habitats 4-14

Figure 4 2. Hanford Site Terrestrial Food Web 4-15

LIST OF TABLES

Table 2-1. Identification of Exposure Areas 2-6

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C 2-8

Table 3-1. Identification of Contaminants of Potential Concern Based on Direct Contact Pathway for Each Exposure Area 3-5

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area 3-20

Table 3-3. Risk Characterization Results for CERCLA Industrial Worker 3-55

Table 3-4. Risk Characterization Results for WAC Industrial Worker Based on Model Toxics Control Act Method C 3-57

Table 3-5. Risk Characterization Results for Construction Worker 3-58

Table 3-6. Risk Characterization Results for Maintenance/Surveillance Worker 3-60

Table 3-7. Risk Characterization Results for CERCLA Trespasser Adult Receptor 3-62

Table 3-8. Risk Characterization Results for CERCLA Trespasser Youth Receptor..... 3-63

Table 3-9. Carcinogenic Risk Results for CERCLA Residential Receptor..... 3-66

Table 3-10. Non-Cancer Hazard Results for CERCLA Residential Receptor 3-67

Table 3-11. Risk Characterization Results for WAC Residential Scenario Based on Model Toxics Control Act Method B Standard..... 3-73

Table 3-12. Risk Characterization Results for Confederated Tribes of the Umatilla Indian Reservation Resident Receptor..... 3-78

Table 3-13. Risk Characterization Results for Yakama Nation Resident Receptor 3-81

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model 3-83

Table 3-15. Radiological Source-Term Soil Concentrations for Exposure Area A + B..... 3-108

Table 3-16. Radiological Source-Term Soil Concentrations for Exposure Area C..... 3-109

Table 3-17. Radiological Source-Term Soil Concentrations for Exposure Area E..... 3-109

Table 3-18. Radiological Source-Term Soil Concentrations for Exposure Area F + G..... 3-110

Table 3-19. Radiological Source-Term Soil Concentrations for Exposure Area H + I..... 3-111

Table 3-20. Radiological Source-Term Soil Concentrations for Exposure Area J..... 3-112

Table 3-21. Radiological Source-Term Soil Concentrations for Exposure Area L1 + L2. 3-113

Table 3-22. Radiological Source-Term Soil Concentrations for Exposure Area P. 3-114

Table 3-23. Radiological Source-Term Soil Concentrations for Exposure Area R..... 3-115

Table 3-24. Radiological Source-Term Soil Concentrations for Exposure Area U. 3-115

Table 3-25. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Industrial Worker Scenario..... 3-117

Table 3-26. Radiological Risk Assessment Results for Exposure Area C under CERCLA Industrial Worker Scenario..... 3-118

Table 3-27. Radiological Risk Assessment Results for Exposure Area E under CERCLA Industrial Worker Scenario..... 3-119

Table 3-28. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Industrial Worker Scenario..... 3-120

Table 3-29. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Industrial Worker Scenario..... 3-121

Table 3-30. Radiological Risk Assessment Results for Exposure Area J under CERCLA Industrial Worker Scenario..... 3-122

Table 3-31. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Industrial Worker Scenario. 3-123

Table 3-32. Radiological Risk Assessment Results for Exposure Area P under CERCLA Industrial Worker Scenario. 3-124

Table 3-33. Radiological Risk Assessment Results for Exposure Area R under CERCLA Industrial Worker Scenario. 3-125

Table 3-34. Radiological Risk Assessment Results for Exposure Area U under CERCLA Industrial Worker Scenario. 3-126

Table 3-35. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Residential Receptor Scenario. 3-127

Table 3-36. Radiological Risk Assessment Results for Exposure Area C under CERCLA Residential Receptor Scenario. 3-128

Table 3-37. Radiological Risk Assessment Results for Exposure Area E under CERCLA Residential Receptor Scenario. 3-129

Table 3-38. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Residential Receptor Scenario. 3-130

Table 3-39. Radiological Risk Assessment Results for Exposure Av H + I under CERCLA Residential Receptor Scenario. 3-131

Table 3-40. Radiological Risk Assessment Results for Exposure Area J under CERCLA Residential Receptor Scenario. 3-132

Table 3-41. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Residential Receptor Scenario. 3-133

Table 3-42. Radiological Risk Assessment Results for Exposure Area P under CERCLA Residential Receptor Scenario. 3-134

Table 3-43. Radiological Risk Assessment Results for Exposure Area R under CERCLA Residential Receptor Scenario. 3-136

Table 3-44. Radiological Risk Assessment Results for Exposure Area U under CERCLA Residential Receptor Scenario. 3-137

Table 3-45. Comparison of Risk Evaluations Based on Statistical Sample Approach and Sample-By-Sample Approach. 3-138

Table 3-46. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area A + B. 3-139

Table 3-47. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area C. 3-140

Table 3-48. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area E. 3-141

Table 3-49. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area F + G. 3-143

Table 3-50. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area H + I. 3-145

Table 3-51. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area J. 3-147

Table 3-52. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area L1 + L2. 3-149

Table 3-53. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area P. 3-151

Table 3-54. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area R. 3-153

Table 3-55. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area U. 3-154

Table 3-56. Results of Carcinogenic Risk Assessment for Exposure Area A + B based on WAC Industrial Worker Scenario. 3-158

Table 3-57. Results of Carcinogenic Risk Assessment for Exposure Area C based on WAC Industrial Worker Scenario. 3-159

Table 3-58. Results of Carcinogenic Risk Assessment for Exposure Area E based on WAC Industrial Worker Scenario. 3-160

Table 3-59. Results of Carcinogenic Risk Assessment for Exposure Area F + G based on WAC Industrial Worker Scenario. 3-161

Table 3-60. Results of Carcinogenic Risk Assessment for Exposure Area H + I based on WAC Industrial Worker Scenario. 3-163

Table 3-61. Results of Carcinogenic Risk Assessment for Exposure Area J based on WAC Industrial Worker Scenario. 3-165

Table 3-62. Results of Carcinogenic Risk Assessment for Exposure Area L1 + L2 based on WAC Industrial Worker Scenario. 3-167

Table 3-63. Results of Carcinogenic Risk Assessment for Exposure Area P based on WAC Industrial Worker Scenario. 3-169

Table 3-64. Results of Carcinogenic Risk Assessment for Exposure Area R based on WAC Industrial Worker Scenario. 3-171

Table 3-65. Results of Carcinogenic Risk Assessment for Exposure Area U based on WAC Industrial Worker Scenario. 3-172

Table 3-66. Results of Carcinogenic Risk Assessment for Exposure Area A + B based on WAC Residential Scenario. 3-173

Table 3-67. Results of Carcinogenic Risk Assessment for Exposure Area C based on WAC Residential Scenario. 3-174

Table 3-68. Results of Carcinogenic Risk Assessment for Exposure Area E based on WAC Residential Scenario. 3-175

Table 3-69. Results of Carcinogenic Risk Assessment for Exposure Area F + G based on WAC Residential Scenario. 3-177

Table 3-70. Results of Carcinogenic Risk Assessment for Exposure Area H + I based on WAC Residential Scenario. 3-179

Table 3-71. Results of Carcinogenic Risk Assessment for Exposure Area J based on WAC Residential Scenario. 3-181

Table 3-72. Results of Carcinogenic Risk Assessment for Exposure Area L1 + L2 based on WAC Residential Scenario. 3-183

Table 3-73. Results of Carcinogenic Risk Assessment for Exposure Area P based on WAC Residential Scenario. 3-185

Table 3-74. Results of Carcinogenic Risk Assessment for Exposure Area R based on WAC Residential Scenario. 3-187

Table 3-75. Results of Carcinogenic Risk Assessment for Exposure Area U based on WAC Residential Scenario. 3-188

Table 3-76. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Industrial Worker Scenario. 3-189

Table 3-77. Results of Non-Cancer Hazard for Exposure Area C based on WAC Industrial Worker Scenario. 3-191

Table 3-78. Results of Non-Cancer Hazard for Exposure Area E based on WAC Industrial Worker Scenario. 3-192

Table 3-79. Results of Non-Cancer Hazard for Exposure Area F + G based on WAC Industrial Worker Scenario. 3-195

Table 3-80. Results of Non-Cancer Hazard for Exposure Area H + I based on WAC Industrial Worker Scenario. 3-197

Table 3-81. Results of Non-Cancer Hazard for Exposure Area J based on WAC Industrial Worker Scenario. 3-199

Table 3-82. Results of Non-Cancer Hazard for Exposure Area L1 + L2 based on WAC Industrial Worker Scenario. 3-201

Table 3-83. Results of Non-Cancer Hazard for Exposure Area P based on WAC Industrial Worker Scenario. 3-203

Table 3-84. Results of Non-Cancer Hazard for Exposure Area R based on WAC Industrial Worker Scenario. 3-205

Table 3-85. Results of Non-Cancer Hazard for Exposure Area U based on WAC Industrial Worker Scenario. 3-207

Table 3-86. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Residential Scenario. 3-208

Table 3-87. Results of Non-Cancer Hazard for Exposure Area C based on WAC Residential Scenario. 3-210

Table 3-88. Results of Non-Cancer Hazard for Exposure Area E based on WAC Residential Scenario. 3-211

Table 3-89. Results of Non-Cancer Hazard for Exposure Area F + G based on WAC Residential Scenario. 3-213

Table 3-90. Results of Non-Cancer Hazard for Exposure Area H + I based on WAC Residential Scenario. 3-215

Table 3-91. Results of Non-Cancer Hazard for Exposure Area J based on WAC Residential Scenario. 3-217

Table 3-92. Results of Non-Cancer Hazard for Exposure Area L1 + L2 based on WAC Residential Scenario. 3-219

Table 3-93. Results of Non-Cancer Hazard for Exposure Area P based on WAC Residential Scenario. 3-221

Table 3-94. Results of Non-Cancer Hazard for Exposure Area R based on WAC Residential Scenario. 3-223

Table 3-95. Results of Non-Cancer Hazard for Exposure Area U based on WAC Residential Scenario. 3-225

Table 3-96. Comparison of Risk and Hazard Evaluations based on Statistical Sample Approach and Sample-By-Sample Approach. 3-227

Table 3-97. Maximum Risk Assessment Results Based on 4- inch Isolation Barrier for CERCLA Industrial Worker Scenario. 3-230

Table 3-98. Source-Term Concentrations for Radiological Contaminants of Potential Concern. 3-233

Table 3-99. Radiological Risk Assessment Results under CERCLA Industrial Worker Scenario for Baseline and Post-Remediation Conditions. 3-234

Table 3-100. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern. 3-234

Table 3-101. Nonradiological Risk Assessment Results for Three Unplanned Releases under CERCLA Industrial Worker Scenario. 3-235

Table 3-102. Nonradiological Risk Assessment Results for Three Unplanned Releases under WAC Industrial Worker Scenario. 3-235

Table 3-103. Source-Term Concentrations for Radionuclide Contaminants of Potential Concern in Leak Affected Soil for Waste Management Area C Past Tank Leaks. 3-236

Table 3-104. Peak Cancer Risks for the CERCLA Construction Worker Scenario at Waste Management Area C Past Tank Releases (Assuming No Soil Cover). 3-237

Table 3-105. Maximum Radiological Doses for the CERCLA Construction Worker Scenario at Waste Management Area C Past Tank Releases (Assuming No Soil Cover). 3-237

Table 3-106. Source-Term Concentrations for Radionuclide Contaminants of Potential Concern in Leak Affected Soil for Surface Releases and 216-C-8 French Drain. 3-239

Table 3-107. Maximum Risk for Surface Area Contamination and 216-C-8 French Drain under a CERCLA Industrial Worker Exposure Scenario. 3-240

Table 4-1. Identification of Contaminants of Potential Ecological Concern for Each Exposure Area 4-6

Table 4-2. Nonradiological Contaminants of Potential Ecological Concern with Hazard Quotient>1 Using Generic Screening Levels 4-10

Table 4-3. Radiological Contaminants of Potential Ecological Concern with Sum-of-the-Fractions>1 Using Generic Screening Levels 4-11

Table 4-4. Results of Tier 1 Screening for Nonradiological Contaminants of Potential Ecological Concern. 4-20

Table 4-5. Results of Tier 1 Screening for Radiological Contaminants of Potential Ecological Concern 4-21

Table 4-6. Determination of Tier 2 Screening Values for Nonradiological Contaminant of Potential Ecological Concerns 4-24

Table 4-7. Hazard Quotients Based on Tier 2 Screening Values 4-26

Table 4-8. Summary of Source Term Concentrations, Soil Benchmarks and Hazard Quotient Values for Nonradiological Constituents at Unplanned Release Locations. 4-29

LIST OF TERMS

Abbreviations and Acronyms

ARAMS	Army Risk Assessment Modeling System
bgs	below ground surface
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulation*
CIE	Cumulative Impacts Evaluation
CMS	corrective measures study
COPC	contaminant of potential concern
COPEC	contaminant of potential ecological concern
CR	concentration ratio
CSM	Conceptual Site Model
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DOE	U.S. Department of Energy
DQA	data quality assessment
DQO	data quality objective
DWS	drinking water standard
EA	exposure area
EC	exposure concentration
Ecology	State of Washington Department of Ecology
EcoSSL	Ecological Soil Screening Level
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ERAGS	Ecological Risk Assessment Guidance for Superfund
FOD	Frequency of Detection
FY	fiscal year
HEIS	Hanford Environmental Information System
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IAMIT	Interagency Management Integration Team
IEUBK	Integrated Exposure Uptake Biokinetic (model)
IRIS	Integrated Risk Information System
KM	Kaplan-Meier (method)

LOAEL	Lowest-Observed-Adverse-Effects-Level
µg/dl	micrograms per deciliter
MDL	method detection limit
mg	milligram
mg/cm^2	milligram per square centimeter
mg/kg	milligrams per kilogram
mg/kg-d	milligrams per kilogram-day
mrem/yr	millirem per year
MTCA	*Model Toxics Control Act*
NJDEP	New Jersey Department of Environmental Protection
NOAEL	No-Observed-Adverse-Effect-Level
NOEC	no observed effect concentration
OSWER	Office of Solid Waste and Emergency Response
pCi/g	picocuries per gram
PoCal	point of calculation
PPRTV	Provisional Peer Reviewed Toxicity Values
PRG	preliminary remediation goal
ProUCL	software used to calculate upper confidence limits
RA	risk assessment
RCRA	*Resource Conservation and Recovery Act of 1976*
RfC	reference concentration
RfD	reference dose
RFI	RCRA facility investigation
RESRAD	RESidual RADioactivity computer code
RME	reasonable maximum exposure
SF	Slope Factor
SLERA	screening level ecological risk assessment
SOF	sum of the fractions (method)
SSL	soil screening level
SST	single-shell tank
SVOC	semi-volatile organic compound
TRV	toxicity reference value
UCL	upper confidence limit
UPR	unplanned release
VOC	volatile organic compound
WAC	*Washington Administrative Code*
WMA	Waste Management Area

PREFACE

This document is the first of four volumes being written to support the Performance Assessment required under Section 2.5 of the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989, hereinafter referred to as HFFACO) Appendix I for closure of the Hanford Site Tank Farms. The first single-shell tank (SST) farm being closed is Waste Management Area (WMA) C.

This particular volume contains is an evaluation of impacts to human and ecological receptors from both non-radiological and radiological contaminants in soils and vadose zone sediments at WMA C under conditions at the time of evaluation, in the absence of actions to control or mitigate releases. This risk evaluation was used to provide supporting information that was relevant to the selection and specific implementation of mitigation measures being undertaken for contaminated soils and vadose zone sediments at a part of the WMA C *Resource Conservation and Recovery Act of 1976* (RCRA) Facility Investigation/Corrective Measures Study.

The other three volumes are as follows:

- **A DOE O 435.1 Performance Assessment** (RPP-ENV-58782, *Performance Assessment of Waste Management Area C, Hanford Site, Washington*) – An evaluation of the impacts from radioactive residual waste contaminants in tanks and ancillary equipment at a closed WMA C. The evaluation is needed by the U.S. Department of Energy (DOE) for closure of WMA C SSTs per DOE O 435.1, *Radioactive Waste Management*;

- **A Hazardous Chemical Impact Analysis from Residual Wastes** (RPP-ENV-58806, *Analysis of Post-Closure Groundwater Impacts from Hazardous Chemicals in Residual Wastes in Tanks and Ancillary Equipment at Waste Management Area C at the Hanford Site, Southeast Washington*) and

- **Analysis of Past Leaks** (**RPP-RPT-59197**, *Analysis of Past Tank Waste Leaks and Losses in the Vicinity of Waste Management Area C at the Hanford Site, Southeast Washington*) – An evaluation of future impacts to human health and the environment from both non-radiological and radiological contaminants from past leaks and releases from WMA C.

1.0 INTRODUCTION

This risk assessment (RA) report presents the potential health impacts to human and ecological receptors from exposure to both nonradiological and radiological contaminants present in the soil and vadose sediment within WMA C. The RA is developed in support of the Phase 2 RCRA facility investigation (RFI).

WMA C is part of the SST system in the 200 East Area of the Hanford Site and is one of the first four tank farm areas built at the Hanford Site in 1944. Notable facilities to be addressed in the closure of WMA C include 12 large SSTs each with a capacity of 2 million liters (530,000 gal), 4 smaller SSTs each with a capacity of 200,000 L (55,000 gal), a catch tank, a vault with 4 tanks, 7 diversion boxes, and about 7 miles of pipelines (Figure 1-1). Environmental releases have occurred in the past to the underlying vadose zone in the vicinity of WMA C. To date, 15 of the 16 SSTs at WMA C have had the previously-stored waste removed (retrieved) including 241-C-101, 241-C-102, 241-C-103, 241-C-104, 241-C-106, 241-C-107, 241-C-108, 241-C-109, 241-C-110, 241-C-111, 241-C-112, 241-C-201, 241-C-202, 241-C-203, and 241-C-204. One other remaining tank (241-C-105) is still undergoing retrieval.

1.1 SCOPE AND OBJECTIVES OF THE RISK ASSESSMENT

This report documents the assumptions and methodologies used to calculate the potential human health and ecological risks associated with exposure to both nonradiological and radiological contaminants present in the soil and vadose zone at WMA C. Three types of assessments were performed as a part of WMA C RA.

1. Human Health Risk Assessment (HHRA) to assess human health direct contact risks for soils within WMA C under various land use scenarios,

2. Screening Level Ecological Risk Assessment (SLERA) to assess risk to ecological receptors, and

3. Assessment for Protection of Groundwater Pathway to evaluate the potential impacts to groundwater from migration of nonradiological and radiological contaminants in contaminated soil through the vadose zone to the aquifer.

Both HHRA and SLERA are intended to provide an assessment of risks to the potential human and ecological receptors from exposure to both nonradiological and radiological contamination present in the soil and vadose zone at WMA C. The specific objectives of the RA are to:

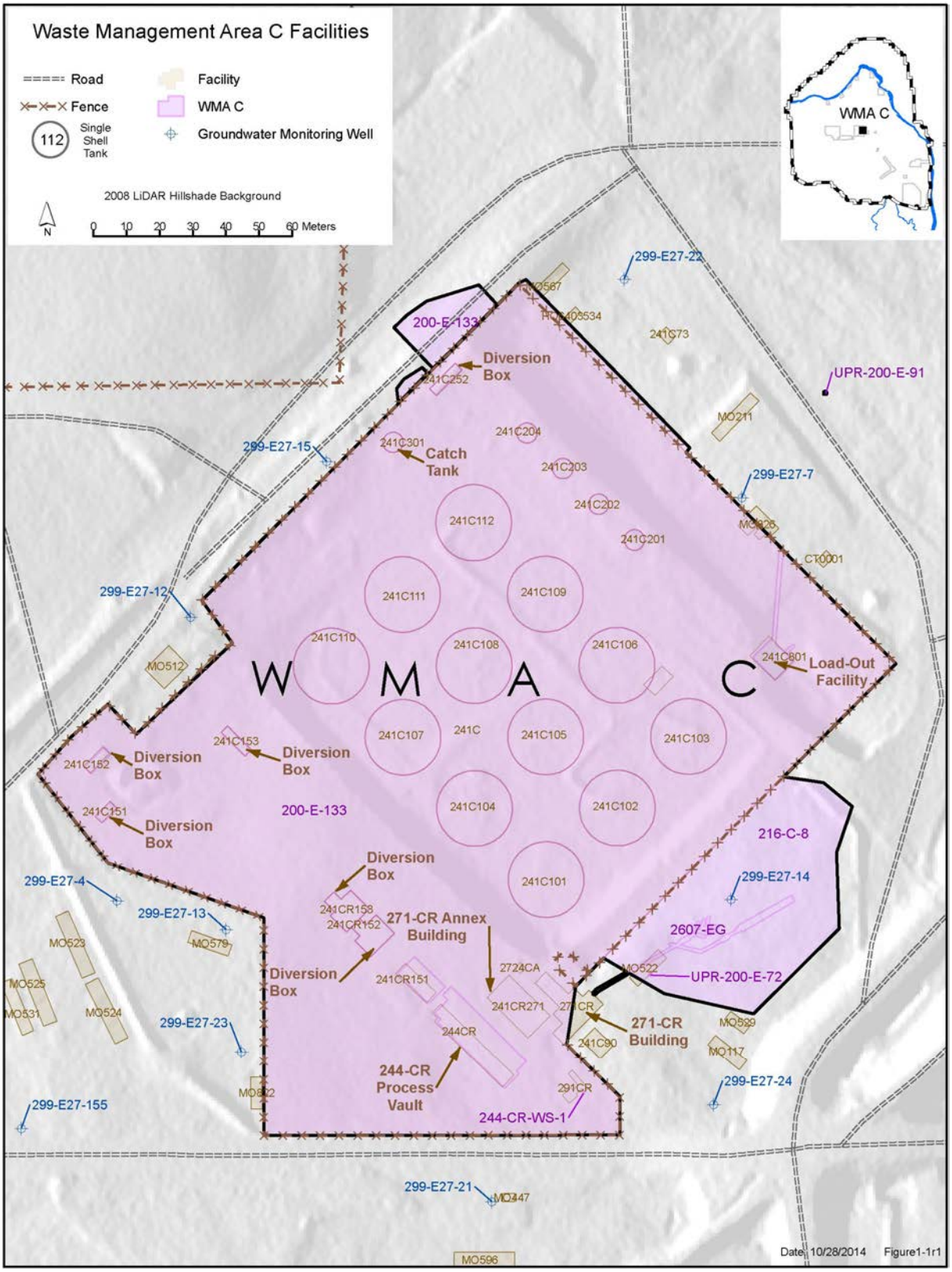
- Estimate potential human health and ecological risks associated with the site if no remedial action occurs,

- Identify areas that pose no unacceptable risks to human health or the environment, and thus do not warrant evaluation in the corrective measure study,

- Identify areas that pose unacceptable risks to human health or the environment, and thus warrant evaluation in the corrective measure study, and

- Develop a list of contaminants of potential concern (COPCs) that contribute to unacceptable risks to human health or the environment.

Figure 1-1. Single-Shell Tanks and Related Facilities in Waste Management Area C.



WMA = Waste Management Area

Assessment for protection of groundwater pathway is performed (Section 3.5.11) to evaluate the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer. A summary of that evaluation is presented in Section 3.5.11. It should be noted that there is existing groundwater contamination beneath WMA C. However, no risk evaluation was performed for existing groundwater contamination within this report as it was evaluated in the 200-BP-5 groundwater remedial investigation report (DOE/RL-2009-127, *Remedial Investigation Report 200-BP-5 Groundwater Operable Unit*). Further, DOE will complete a "Cumulative Impacts Evaluation" to integrate the current and future impacts to groundwater from numerous comingling sources.

1.2 RISK ASSESSMENT APPROACH

The general approach for conducting the risk assessment follows U.S. Environmental Protection Agency (EPA) risk assessment guidance and the data quality objective (DQO) process. The DQO process consists of a series of planning steps, based on the scientific method, that are designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for their intended purpose. The approach focuses on clearly defining the problem to be resolved (identification and, as appropriate, remediation or control of unacceptable risk) by focusing on the decisions to be made and the overall quality of data necessary to make these decisions. The risk assessment process produces information necessary for making risk management decisions.

The DQO for this risk assessment was to identify any unacceptable risks to human health and ecological receptors. The risk assessment identified receptors who may be exposed to site contaminants, the exposure pathways through which receptors are potentially exposed to site contaminants, and the concentrations of chemical contaminants in environmental exposure media (e.g., soil) for each exposure area. Based on these elements, and the specific toxicity of the site contaminants, the non-cancer hazards and carcinogenic risks were calculated and the uncertainty associated with these calculations discussed. The risk assessment ultimately identifies those contaminants found at unacceptable levels of risk and provides information to be used by stakeholders for risk management decisions.

The risk assessment process typically involves the following five steps.

- **Data Review and Evaluation** involves several steps. During the first, the process prepares the data set for use in the risk assessment. During the second step, COPCs are selected.

- **Exposure Assessment** evaluates the magnitude, frequency, duration, and routes of potential human exposure to site-related COPCs. The exposure assessment considers both current and potential future site uses under a range of potential exposure scenarios and is based on complete exposure pathways for soil contamination to either actual or hypothetical receptors (i.e., generalized groups that could come in contact with site-related COPCs). Exposure scenarios are summarized in the Conceptual Site Model

(CSM), which includes the sources, affected media, release mechanisms, and exposure pathways for each identified receptor population.

- **Toxicity Assessment** provides a review of available scientific information to identify the nature and degree of toxicity, and to characterize the dose-response relationship (i.e., the relationship between magnitude of exposure and magnitude of potential adverse health effects on each receptor) for each COPC.

- **Risk Characterization** is a synthesis of exposure and toxicity information to yield quantitative estimates of potential cancer risks and non-cancer hazards to defined receptor populations.

- **Assessment of Uncertainty** identifies and characterizes the uncertainties associated with each of the four previous steps to assist decision-makers in evaluating the risk assessment results in the context of the assumptions and variabilities in the data used.

1.3 REPORT ORGANIZATION

The general format of this document is as follows.

- Chapter 1: Introduction. This section presents the general purpose and scope of the RA, the overall approach to the RA, and the RA Report organization.

- Chapter 2: Data Collection and Evaluation. This section summarizes the site-related constituents, history of site investigations, sampling information, data validation and evaluation processes, and the selection of dataset for each exposure area.

- Chapter 3: Human Health Risk Assessment. This section describes how COPCs were identified for quantitative risk assessment; presents the land use and potentially exposed receptors (people), conceptual site model, methodology for estimating exposure point concentrations (EPCs), and intake equations and exposure factor parameter values; describes the approaches for evaluating nonradiological and radiological toxicity; describes the methodology used for the estimation of health hazard and cancer risk, and discusses sources and implications of uncertainty in the risk characterization.

- Chapter 4: Screening Level Ecological Risk Assessment. This section describes when, how, and why particular ecological entities may be exposed to nonradiological and radiological stressors present at the site; describes the tiered based assessments; and discusses sources and implications of uncertainty in the risk characterization.

- Chapter 5: Summary and Conclusions. This section summarizes the results of HHRA and SLERA.

- Chapter 6: References. This section lists the references cited in the HHRA and SLERA.

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2.0 DATA COLLECTION AND EVALUATION

In accordance with the RFI Work Plans and the Sampling and Analysis Plans, soil samples were collected and analyzed for radionuclides, inorganics (metals, anions), semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls, polyaromatic hydrocarbons, and pesticides. This section describes the sources of data used in the risk assessment (Section 2.1), the data quality assessment (DQA) and data validation processes (Section 2.2), the selection of exposure areas (Section 2.3), and the identification of exposure-specific datasets for each exposure area (Section 2.4).

2.1 COLLECTION OF SOIL SAMPLES

The soil characterization data set collected for the RFI consists of sampling and analysis of soil samples at 13 judgment sampling locations (A, B, C, E, F, G, H, I, J, L1/L2, P, R, and U). The basis for the site characterization includes soil samples collected and analyzed using the methods documented in the work plan, sampling and analysis plan, and other documents listed below:

- RPP-RPT-38152, *Data Quality Objectives Report Phase 2 Characterization for Waste Management Area C RCRA Field Investigation/Corrective Measures Study*;
- RPP-PLAN-39114, *Phase 2 RCRA Facility Investigation/Corrective Measures Study Work Plan for Waste Management Area C*; and
- RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*.

Figure 2-1 presents the final sampling locations in relationship to existing surface features. The final sampling locations were established based on collected geophysical data and facility walk-downs conducted prior to deployment of the sampling equipment to the sample site.

RPP-RPT-39114 provided the following information on sample collection requirements.

- An average of eight samples collected per sample location.
- Surface samples collected from ~0 to 1 ft below ground surface (bgs).
- Three samples collected at depths less than 15 ft bgs:
  - 5 ft bgs
  - 10 ft bgs
  - 14 ft bgs.

For depths greater than 15 ft bgs (i.e., deep), sample intervals were determined by reviewing the gamma and moisture logs of the first direct push and any of the following available information:

- Pertinent leak loss inventory information

- Geologic information
- Operational history
- Historical characterization data.

These sampling horizons were selected in meetings with Washington River Protection Solutions, the DOE, the State of Washington Department of Ecology (Ecology), EPA, and other site contractors, as available. Documentation of sample selections is provided in RPP-RPT-58339. Therefore, in accordance with the Interagency Management Integration Team (IAMIT) Determination 2019-006, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Judgmental Sample Analysis*, an additional HHRA were performed using a sample-by-sample evaluation.

2.2 VALIDATION AND ANALYSIS OF SOIL SAMPLING RESULTS

All sampling and analysis data for WMA C reside in the Hanford Environmental Information System (HEIS) database. To support the use of the data in the RFI process, the data were downloaded from the HEIS database and validated through a supplemental DQA process. Data qualification flags and validation qualifiers are assigned during the data validation process. The following rules are applied to determine how flagged and qualified sample results are used.

- All sample results flagged with a “U” qualifier, or combination of qualifiers that include a “U,” such as a “UJ,” are considered non-detected concentrations.

- All sample results without a “U” qualifier are considered detected concentrations, including results without a qualifier or with “E” or “J” qualifiers.

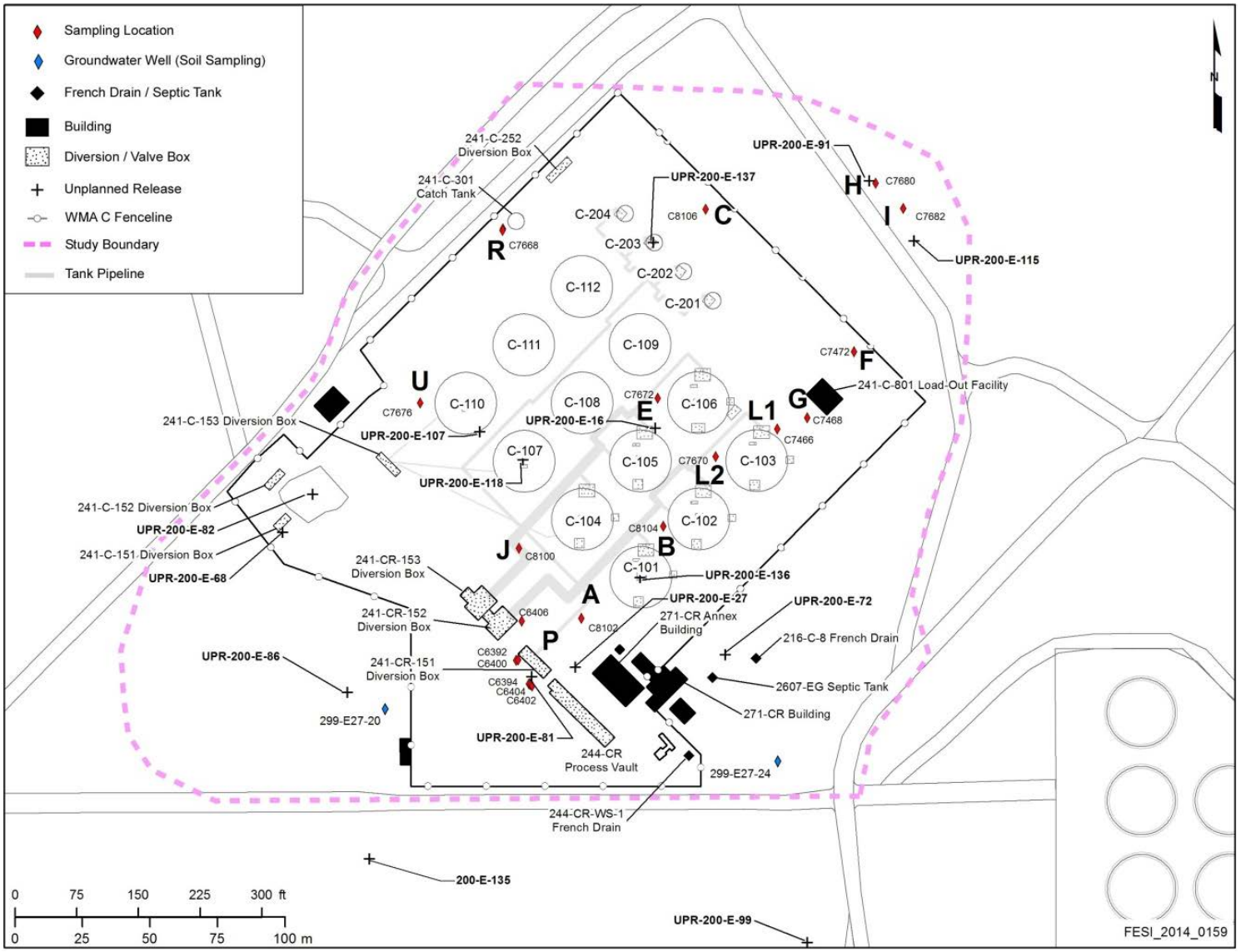
- Samples that are rejected and flagged with an “R” validation qualifier are not used for calculating EPCs.

Where:

U = Analyzed for but not detected above limiting criteria.
J = Estimated value.
E = Reported value is estimated because of interference (inorganics).
R = Do not use. Further review indicates the result is not valid.

It should be noted that detailed information related to the handling of detect and non-detect sample results for radiological and nonradiological contaminants are provided in Section 3.2.2.

Figure 2-1. Final Sampling Locations with Respect to Physical Features.



WMA = Waste Management Area

The DQA process followed general DQA guidelines established in EPA/240/B-06/002, *Data Quality Assessment: A Reviewer's Guide EPA QA/G-9R* and EPA/240/B-06/003, *Data Quality Assessment: Statistical Methods for Practitioners EPA QA/G-9S*. The DQA assessed the laboratory data for soil samples obtained from 13 judgment sampling locations. The results of the DQA are documented in Appendix M of the RFI report. The conclusions of the DQA determined that the soil sampling results are the right type and of sufficient quality and quantity to support the BRA and selection of remedial alternatives. The DQA document served as the source of the analytical data used for this risk assessment.

2.3 DATA EVALUATIONS

The validated data set included the following types of information:

- Results for a given analyte reported by more than one analytical method
- Parent and field duplicate results.

Two data evaluations were performed to identify one set of results per sampling location and date of sample collection. They are summarized in the following section.

2.3.1 Data Evaluation for Analytes Reported by Numerous Analytical Methods

Analytes are often reported by more than one analytical method; therefore, multiple results for an analyte at the same location and sample date are possible. Because multiple sets of analytical results cannot be used to quantify risk (i.e., this would result in multiple counting of a chemical), the data set that best represents the actual concentration will be retained. The results are processed to select the method that provides the most reliable results. Considerations for determining data to be retained include method-associated sample size, detection frequency, method sensitivity, and detection limits. The most conservative (i.e., health-protective) use of these types of data is the goal. Larger sample size, higher detection frequencies, and lower detection limits are given higher priority for method selection.

For example, lead may be analyzed using EPA Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry" (EPA-600/R-94/111, *Methods for the Determination of Metals in Environmental Samples, Supplement 1*) with an estimated quantitation limit of 500 µg/kg or EPA Method 6010C, "Inductively Coupled Plasma-Atomic Emission Spectrometry" (EPA 2007) with an estimated quantitation limit of 5,000 µg/kg. For a sample with lead concentrations reported using both methods, the results reported by EPA Method 200.8 are chosen over EPA Method 6010 because of the more sensitive detection limit.

2.3.2 Data Evaluation for Samples with Field Duplicate Results

Field quality control samples (field duplicates) are collected in the field and are analyzed by the laboratory as unique samples. The parent sample and quality control samples are collected from the same location on the same date, resulting in more than one sample per location and date.

Because multiple sets of analytical results cannot be used to quantify risk (i.e., this would result in multiple-counting of a chemical), the results for the same location and date are reduced to a single result for each reported analyte. The following criteria are used to reduce multiple sample results for one location and date to a single result per analyte. The most conservative (i.e., health-protective) result is the goal.

- If two or more detections exist, the maximum concentration is used.
- If at least one detection and one or more nondetected results exist, the detected concentration is used.
- If only (two or more) nondetected results exist, the lowest detection limit is used.

Nondetected samples were analyzed for but not detected above limiting criteria. Limiting criteria may be any of the following: value reported < 0; value reported < counting error; value reported < total analytical error; value reported ≤ contract minimum detectable activity. The reporting results associated with nondetected samples have greater uncertainties as compared to the sample results associated with detected samples. Further, samples are sometimes diluted for certain measurements to be made which results in non-detection for some contaminants. In general, detected sample results were given higher preference when both detected and nondetected results were available for the same sample. When only nondetected results were available for a sample, the result with the lowest detection limit was used in the analysis.

2.4 IDENTIFY EXPOSURE AREA-SPECIFIC DATA SETS

For the purpose of the risk assessment, site characterization data collected from 13 judgment sampling locations within WMA C are grouped into 10 primary exposure areas (EAs). OSWER 9285.6-10, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* states that "An exposure unit is the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure. Unless there is site-specific evidence to the contrary, an individual receptor is assumed to be equally exposed to media within all portions of the exposure unit over the time frame of the risk assessment." The terms "exposure unit" and "exposure area" are considered operationally equivalent for this RA. The EAs, their general locations within WMA C, and their Phase 2 characterization objectives are identified in Table 2-1. Figure 2-2 presents the EAs within WMA C.

2.5 IDENTIFY EXPOSURE-SPECIFIC DATA SET FOR EACH EXPOSURE AREA

Under the 2013 Washington State *Model Toxics Control Act* (MTCA) (*Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act") cleanup regulations (*Washington Administrative Code* [WAC] 173-340-740, "Unrestricted Land Use Soil Cleanup Standards"), the point of compliance for soil cleanup levels based on the direct contact pathway is defined as the zone extending from the ground surface to 15 ft bgs). A deep vadose zone (>15 ft bgs exposure scenario may also be evaluated to screen for sites that pose a potential

risk from inadvertent exposure through deep zone excavation activities and to allow institutional controls to be established at those sites to control access to deep zone contamination. The analytical data sets from samples collected from shallow vadose zone soil (0 to 15 ft bgs) for each EA were utilized during this RFI RA evaluation at WMA C.

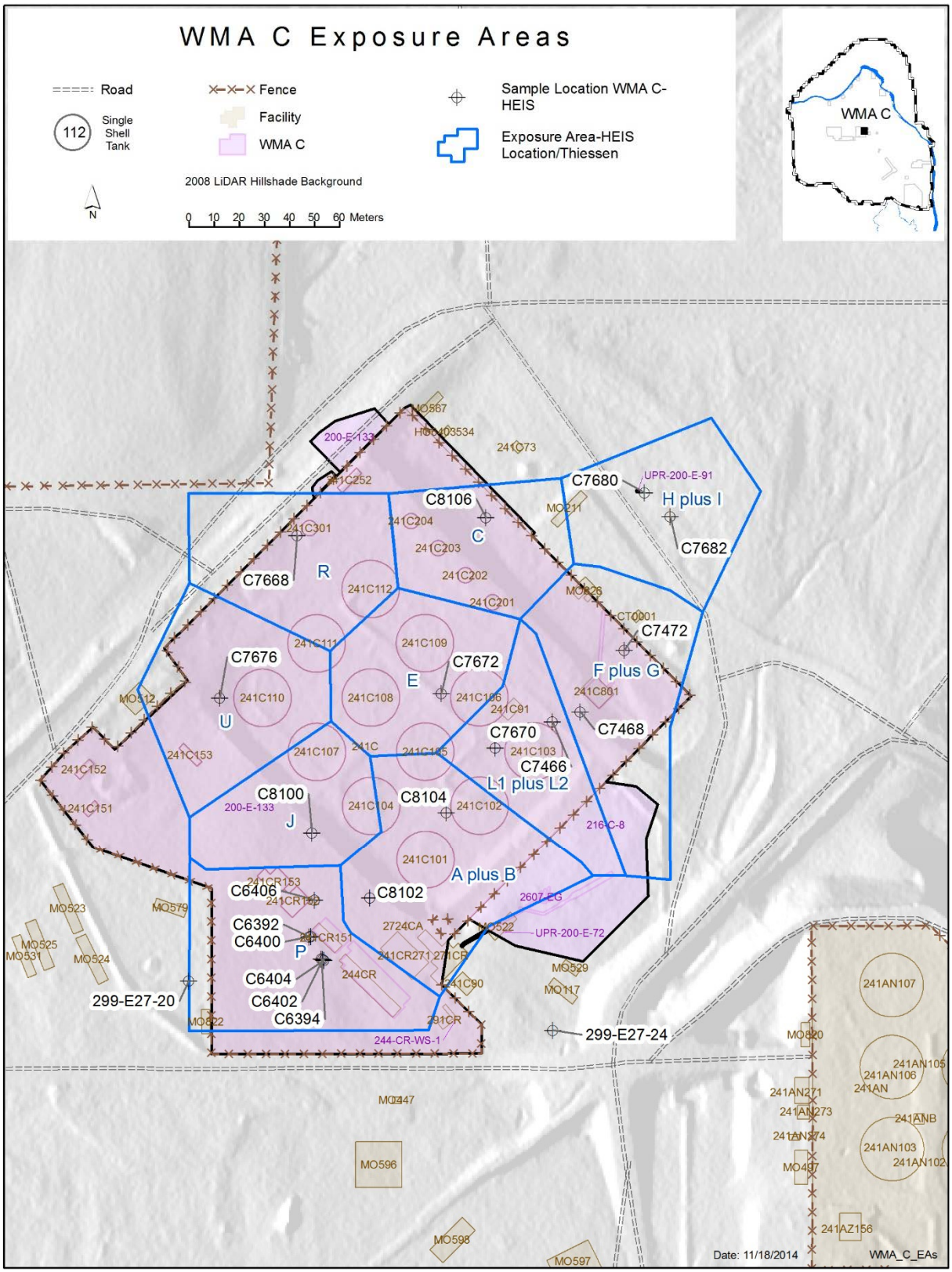
Table 2-1. Identification of Exposure Areas.

Exposure Areas	General Location Within Waste Management Area C (See Figure 2-1)	Phase 2 Characterization Objective
A + B	Area near tank 241-C-101	Characterize releases from tank 241-C-101
C	Area near 241-C-200 series tanks	Determine if C-200 tanks actually leaked, and determine if any C-200 tank leaked during retrieval
E	Area between tanks 241-C-106 and 241-C-109	Assess ^{60}Co
F + G	Area near tank 241-C-103 and Building C-801, and Building C-801 chemical drain	Assess release of Plutonium Uranium Extraction plant waste, ^{137}Cs and ^{99}Tc,and ^{60}Co
H + I	Area northeast of UPR-200E-91 and UPR-200E-115	Assess surface exposures, and assess ^{60}Co and surface release conceptual models
J	Area near tank 241-C-104	Assess suspected release
L1 + L2	Area between tanks 241-C-103 and 241-C-106	Updated logging data for ^{60}Co, ^{137}Cs, Uranium, and moisture and assess potential release
P	Area near UPR-81	Characterize release
R	Area near 241-C-301 catch tank	Assess potential catch tank release
U	Area near tank 241-C-110	Characterize tank 241-C-110 release

Table 2-2 presents a summary of all shallow zone soil samples, collected from the ground surface to 15 ft bgs. The table includes information related to each EA, borehole, sample IDs, and sample depths.

The MTCA point of compliance for groundwater protection is throughout the vadose zone (ground surface to groundwater) [WAC 173-340-740, subsection (6) “Point of compliance,” item (b)]. Therefore, during the “protection of groundwater pathway” assessment, the sampling results for both shallow and deep vadose zone are included.

Figure 2-2. Exposure Areas within Waste Management Area C.



HEIS = Hanford Environmental Information System WMA = Waste Management Area

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
A+B	C8102	B2B1L8	0	1	0.50
		B2B1L9			
		B2D1P9	5.7	7.7	6.1
		B2D1X2		9.7	6.8
		B2D1X4	11.5	15.5	11.4
		B2D1X5	16.1	18.1	14.1
	C8104	B2FPF1	0.5	1	0.50
		B2FPF2			
		B2F9Y7	5.7	7.7	5.1
		B2FB27			
		B2FB29	11.5	15.5	11.1
		B2F9X9	13.5		11.9
		B2F9Y3	16.1	18.1	14.2
		B2FB30			
C	C8106	B2FPR7	1	1.5	0.50
		B2FPR8			
		B2FYM3	11	13	6.5
		B2FPT5	19	21	11.5
		B2FYM4			
E	C7672	B26JK2	0	1	0.50
		B26JK3			
		B26JL2			
		B26JL3			
		B26C68	5	7	6.0
		B26C68C			
		B26C69			
		B26C70	10	12	11.0
		B26C70A			
		B26C71			

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
E (continued)	C7672 (continued)	B26C74	14	16	15.0
		B26C74B			
		B26C75			
F+G	C7468	B21221	0	1	0.50
		B21222			
		B215L0			
		B215L1			
		B211Y3	5	7	6.0
		B211Y5			
		B211Y6	10	12	11.0
		B211Y8			
		B211Y9	14	16	15.0
		B21201			
	C7472	B236N5	0	1	0.50
		B236N7			
		B236N8			
		B236P0			
		B236P2	5	7	6.0
		B236P4			
		B236P7	10	12	11.0
		B23KT4		14	12.0
		B236P8C	12		13.0
		B238H1	14	16	15.0
		B238H1C			
		B238H3			

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
H+I	C7680	B26JK8	0	1	0.50
		B26JK9			
		B26JL8			
		B26JL9			
		B26C26	5	7	6.0
		B26C26A			
		B26C27			
		B26C28	10	12	11.0
		B26C28B			
		B26C29			
		B26C30	14	16	15.0
		B26C30A			
		B26C31			
	C7682	B26JL0	0	1	0.50
		B26JL1			
		B26JM0			
		B26JM1			
		B26C47	5	7	6.0
		B26C48			
		B26C50	10	12	11.0
		B26C51	12	14	13.0
		B26C51B			
		B26C53	14	16	15.0
		B26C53A			
		B26C54			
J	C8100	B2B1L6	0	1	0.50
		B2B1L7			
		B2BX79	5.7	7.7	4.9
		B2C1M2			
		B2C1M3	15	19	13.5

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
L1+L2	C7466	B211X9	0	1	0.50
		B211Y0			
		B215K8			
		B215K9			
		B20XW6	5	7	6.0
		B20XW8			
		B20XW9	10	12	11.0
		B20XX1			
		B20XX2	14	16	15.0
		B20XX4			
	C7670	B23KN6	0	1	0.50
		B23KN7			
		B23KN9			
		B23R25			
		B238J9	5	7	6.0
		B238J9A			
		B23KN4			
		B23KP2	10	12	11.0
		B25CN2		14	12.0
		B23KP6	14	16	15.0
		B23KP6A			
		B23KP8			
P	C6392	B1YT69			
		B1YT71			
		B1YT71A			
	C6400	B1YTF9	5	7	6.0
		B1YTH1			
		B1YTH1A			

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
P (continued)	C6400 (continued)	B1YTF8	10	12	11.0
		B1YTH3			
		B1YTH3A			
	C6402	B20XV5	6	8	7.0
		B20XV7			
		B20XV9	10	12	11.0
		B20XV9A			
		B20XW1			
		B20XW3	14	16	15.0
		B20XW5			
	C6404	B1YT90	6	8	7.0
		B1YT92			
		B1YT93	10	12	11.0
		B1YTD5C	14	16	15.0
	C6406	B1YTC7	5	7	6.0
		B1YTC9			
		B1YTD0	10	12	11.0
		B1YTD2			
		B1YTD2A			
		B1YTD3	14	16	15.0
		B1YTD5			
		B1YTD5B			
R	C7668	B23TK2	0	1	0.50
		B23TK4			
		B23TK5			
		B23TK8	5	7	6.0
		B23TL0			
		B23TL6	10	12	11.0
		B27130		14	12.0
		B23TM2	14	16	15.0

Table 2-2. Shallow Zone Soil Characterization Samples for Waste Management Area C. (6 sheets)

Exposure Area	Borehole ID	Sample ID	Top Depth (ft)	Bottom Depth (ft)	Average Slant Depth (ft)
U	C7676	B26JK6	0	1	0.50
		B26JK7			
		B26JL6			
		B26JL7			
		B26CC0	5	9	7.0
		B26CC0A		7	6.0
		B26CC1			
		B29612		9	7.0
		B26CC4	10	12	11.0
		B26CC4C			
		B26CC5			
		B26CC6A	14	16	15.0
		B26CC7			

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3.0 HUMAN HEALTH RISK ASSESSMENT

The U.S. Department of Energy (DOE) is required to assess human and ecological risk under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), RCRA, *National Environmental Policy Act of 1969*, and DOE orders. The "National Oil and Hazardous Substances Contingency Plan" (Title 40, *Code of Federal Regulations* [CFR], Part 300), specifically requires a site-specific baseline RA to be performed at the Site (40 CFR 300, Subpart E—Hazardous Substance Response, §300.430, "Remedial investigation/feasibility study and selection of remedy," subsection [d][4]). Therefore, a site-specific HHRA was conducted as a part of the RA for WMA C.

The objective of the HHRA is to provide an analysis of baseline human health risks that will be used to determine the need for remedial action at the site. The HHRA will also identify nonradiological and radiological COPCs that may be retained for further evaluation in the corrective measures study (CMS).

The technical approach for the RA is consistent with the EPA guidance for performance of HHRAs at CERCLA or RCRA sites. Remedial action goals related to chemical cancer risk and hazards may be based on screening models of the 2013 MTCA in WAC 173-340, "Model Toxics Control Act—Cleanup." Therefore, in addition to the quantitative CERCLA-compliant HHRA, this approach includes a separate RA methodology consistent with the State of Washington 2013 MTCA WAC 173-340 regulations. The following guidelines were established by EPA and Washington State for assessing risk to human health:

- EPA/540/1-89/002, *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual, (Part A) Interim Final*

- OSWER Directive 9285.6-03, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual Supplemental Guidance "Standard Default Exposure Factors" Interim Final*

- EPA/540/R-92/003, *Risk Assessment Guidance for Superfund: Volume I – Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals) Interim*, Publication 9285.7-01B

- EPA/600/R-090/052F, *Exposure Factors Handbook: 2011 Edition*

- EPA/540-R-00-007, *Soil Screening Guidance for Radionuclides: User's Guide*, OSWER Directive 9355.4-16A

- OSWER 9355.4-24, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*

- EPA/540/R-99/005, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final*

- EPA530-R-05-006, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities Final*
- WAC 173-340-708, "Human Health Risk Assessment Procedures"
- WAC 173-340-720, "Groundwater Cleanup Standards"
- WAC 173-340-740, "Unrestricted Land Use Soil Cleanup Standards"
- WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties"
- WAC 173-340-747, "Deriving Soil Concentrations for Groundwater Protection."

Two types of HHRAs were conducted for contaminants present in the soil and vadose sediment within WMA C. In addition, supplemental analyses are presented that are used to support the CMS alternative evaluation. Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for contaminants. However, due to the presence of extensive amounts of interferences caused by buried infrastructure and topographic constraints, a judgmental sampling approach was applied. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA was performed for five risk scenarios using a sample-by-sample evaluation. In addition, three supplemental RAs were conducted to support the CMS alternatives evaluation process as documented in RPP-RPT-59379, *Waste Management Area C Phase 2 Corrective Measures Study Report*. All HHRAs are presented in the following sections.

3.1 HUMAN HEALTH RISK ASSESSMENT USING STATISTICAL APPROACH

The HHRA methodology using a statistical approach for both nonradiological and radiological contaminants is presented in the following subsections of this report:

- Section 3.1.1 provides criteria used to evaluate and screen Site data and to determine the COPCs that were evaluated in the HHRA;
- Section 3.1.2 defines land use assumptions and receptors that were evaluated in the HHRA;
- Section 3.1.3 presents the methodology and guidance that were used to perform the toxicity assessment for both radiological and nonradiological COPCs;
- Section 3.1.4 presents the methodology that was used to conduct the risk characterization for both radiological and nonradiological COPCs;
- Section 3.1.5 presents the results of the RAs.

3.1.1 Identification of Contaminants of Potential Concern for Each Exposure Area

Shallow zone (0 to 15 ft bgs) soil sample data collected from 14 sampling locations within WMA C were utilized during the HHRA (Section 3) and SLERA (Section 4) to meet the requirements of direct contact exposure pathway as stated in WAC 173-340-740(6)(d). It should be noted that soil samples were also collected from deep vadose zone (>15 ft bgs). Soil samples collected from both shallow and deep vadose zones were utilized for performing an assessment referred to as the "protection of groundwater pathway" to understand the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer (Section 3.5.11).

As a part of HHRA, data reduction screen and weight of evidence screens were performed to identify COPCs for each EA. The EPA guidance for conducting background comparison (EPA 540-R-01-003, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, OSWER 9285.7-41) suggests comparing site concentrations with risk-based screening levels to identify COPCs and carrying chemicals through the RA process as COPCs if they exceed risk-based screening levels. The EPA Regional Screening Level tables (Regional Screening Levels for Chemical Contaminants at Superfund Sites, Queried 11/2014, [Regional Screening Table], http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/) provide comparison values for residential and commercial/industrial exposures to soil, air, and tapwater (drinking water) that could be used as risk-based screening values for COPC identification at WMA C. However, for consistency with the approach used for RAs at Hanford's River Corridor operable units, the RA for WMA C was performed for all detected nonradiological and radiological COPCs to include their contributions towards total risk. Therefore, no risk-based screening was performed during the identification of COPCs. However, risk-based screening values will be considered during the selection of their cleanup levels. In addition, no background screen was performed to identify COPCs. However, the site concentrations are compared against the background concentrations during the risk characterization for retaining any COPC for further evaluation. The following sections of the report summarize the screening processes.

3.1.1.1 Data Reduction Screen. Under the data reduction screen, four exclusion criteria were used to identify soil COPCs for each EA. Analytes that met one or more of the exclusion criteria were eliminated. Analytes that did not meet any of the exclusion criteria were carried forward into the next screen. The exclusion criteria include the following.

Criterion 1: Essential Nutrients. These chemicals are considered to be human nutrients essential to a well-balanced diet, and as such are often added to foods as supplements. For this reason they typically are not considered hazardous to humans. Therefore, the essential nutrients (minerals) are not considered as soil COPCs. The essential nutrients calcium, magnesium, potassium, and sodium were detected in samples in WMA C but are excluded from further consideration.

Criterion 2: Naturally Occurring Radionuclides. The radionuclides considered to be naturally occurring and not directly related to Hanford Site operations or processes are eliminated from further consideration as soil COPCs. Six naturally-occurring radionuclides associated with background radiation (^{40}K, ^{226}Ra, ^{228}Ra, ^{228}Th, ^{230}Th, and ^{232}Th) were eliminated.

Criterion 3: Radionuclides with Half-Lives of Less than 3 Years. Radionuclides with half-lives of less than 3 years are eliminated from further consideration as soil COPCs. Only a small fraction of their original activity remains after 30 years of decay since operations have ceased. They are either insignificant dose and risk contributors or their contributions are already included within the contributions of their parent. For WMA C, only 10 of 27 short-lived radionuclides were detected and their concentrations are so low that all of those short-lived radionuclides will produce negligible contribution to total risk. Hence, those short-lived radionuclides were eliminated from further consideration for identification of COPCs.

Criterion 4: Analytes without Known Toxicity Information. Analytes without known toxicity information are eliminated from further consideration as COPCs. For WMA C, HHRA was performed for radionuclides, metals, VOC, SVOCs/polyaromatic hydrocarbons and pesticides/herbicides. Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 11 SVOCs and 4 pesticides/ herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes and were used when they were detected during radiological risk assessment. Among 2 VOCs, one has not been detected and the other, (m+p)-Xylene was detected in one sample out of 47 samples with a very low concentration (less than 1% of the screening values for the surrogate compounds). None of the SVOCs and pesticides were detected. Because of the lack of detection, those analytes will not contribute to the total risks.

3.1.1.2 Weight of Evidence Screen. Chemicals and radionuclides that have been analyzed for, but not detected, in any sample (collected from appropriate locations with adequate detection limits) were eliminated as COPCs. Both human health risk-based screening levels and ecological screening values were considered during the selection of the detection limits achievable for each of the analytes evaluated. The results for WMA C Phase 2 RFI samples were reported to the laboratories' method detection limit (MDL). The MDL is the lowest concentration at which an analyte can be measured and reported with 99% confidence that the analyte concentration is greater than zero, and is determined from analysis of a sample in a given matrix containing the analyte. If an analyte is not detected at a concentration greater than or equal to the MDL, it cannot be stated that the analyte is not present in the sample; but rather, with 99% certainty, the analyte is not present at a concentration greater than or equal to the MDL. Sampling results for 37 primary and secondary COPCs were reported as not detected at MDLs exceeding target detection limits. The required and target detection limits were, in most instances, risk-based or statistically derived. Some exceedances were attributable to result calculation based on aliquot size used for preparation and analysis. Other exceedances were attributable to sample dilutions needed to alleviate interference from other analytes in the sample (high concentrations, overlapping peaks, etc.) or the sample matrix. A number of exceedances were attributable to the variability in MDLs across laboratories. All analytes detected at least once were identified as COPCs.

After removing the excluded analytes, a total of 110 of the analytes remaining were not detected in the WMA C Phase 2 soil samples. Non-detected analytes in WMA C soil data included 1 anion, 1 metal, 5 polychlorinated biphenyl aroclors, 15 pesticides, 6 radionuclides, 32 SVOCs, and 50 VOCs. Table 3-1 identifies the list of both radiological and nonradiological COPCs for each EA.

Table 3-1. Identification of Contaminants of Potential Concern Based on Direct Contact Pathway for Each Exposure Area. (3 sheets)

Contaminants of Potential Concern*	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Radiological Contaminants of Potential Concern										
Americium-241	X	—	—	—	—	—	—	X	—	—
Carbon-14	X	—	—	X	X	X	X	—	—	X
Cesium-137	X	X	X	X	—	X	X	X	—	X
Cobalt-60	—	—	—	—	—	—	—	X	—	—
Iodine-129	—	—	—	—	—	—	—	X	—	—
Neptunium-237	—	—	—	—	—	—	—	X	—	X
Nickel-63	—	X	—	—	—	—	X	X	—	—
Plutonium-238	—	—	—	—	—	X	—	—	—	—
Plutonium-239/240	X	—	—	—	—	X	—	X	—	—
Plutonium-241	X	—	—	—	—	X	—	X	—	—
Selenium-79	X	—	X	X	X	X	X	X		X
Strontium-90	X	X	X	X	—	X	X	X	X	X
Technetium-99	—	—	—	—	—	—	—	X	—	—
Tin-126	X	X	X	X	X	—	X	—	—	X
Tritium (H-3)	—	—	—	—	X	—	X	X	X	
Uranium-233	—	—	X	X	X	—	X	X	X	X
Uranium-234	X	—	X	X	X	—	X	X	X	X
Uranium-235	X	X	X	X	X	X	X	X	X	X
Uranium-236	—	—	X	X	X	—	X	X		X
Uranium-238	X	X	X	X	X	X	X	X	X	X
Nonradiological Contaminants of Potential Concern										
Aluminum	X	X	X	X	X	X	X	X	X	X
Antimony	X	X	X	X	X	X	X	X	X	X
Arsenic	X	X	X	X	X	X	X	X	X	X
Barium	X	X	X	X	X	X	X	X	X	X
Beryllium	—	X	X	X	X	X	X	X	X	X
Boron	—	—	X	—	—	X	—	—	—	X
Cadmium	X	X	X	X	X	X	X	X	X	—

Table 3-1. Identification of Contaminants of Potential Concern Based on Direct Contact Pathway for Each Exposure Area. (3 sheets)

Contaminants of Potential Concern*	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Chromium	X	X	X	X	X	X	X	X	X	X
Cobalt	X	X	X	X	X	X	X	X	X	X
Copper	X	X	X	X	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X	X	X	X	X
Iron	X	X	X	X	X	X	X	X	X	X
Lead	X	X	—	X	X	X	X	X	X	X
Lithium	X	X	X	X	X	X	X	X	X	X
Manganese	X	X	X	X	X	X	X	X	X	X
Mercury	—	X	X	X	—	X	X	X	X	X
Molybdenum	—	—	—	—	X	—	X	—	—	X
Nickel	X	X	X	X	X	X	X	X	X	X
Nitrate	X	X	X	X	X	X	X	X	X	X
Nitrite	X	X	X	X	X	X	X	X	X	X
Selenium	—	—	X	—	X	—	X	—	X	—
Silver	X	X	X	X	X	X	X	X	X	X
Strontium	X	X	X	X	X	X	X	X	X	X
Tin	X	—	—	X	—	X	—	X	—	—
Total Uranium	X	X	X	X	X	X	X	X	X	X
Vanadium	X	X	X	X	X	X	X	X	X	X
Zinc	X	X	X	X	X	X	X	X	X	X
Acetone	—	—	X	—	—	—	X	X	X	X
Benzene	—	—	—	—	—	—	—	X	—	X
Bis(2-ethylhexyl) phthalate	—	—	—	X	—	X	—	—	—	—
1-Butanol	—	—	—	—	—	—	X	—	—	—
2-Butanone	—	—	—	X	—	—	—	—	—	—
Butylbenzylphthalate	—	X	X	X	X	X	X	—	X	—
Diethylphthalate	X	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	X	—	—	X	—	—
2-Hexanone	—	—	—	—	—	—	—	—	X	—

Table 3-1. Identification of Contaminants of Potential Concern Based on Direct Contact Pathway for Each Exposure Area. (3 sheets)

Contaminants of Potential Concern*	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Nonradiological Contaminants of Potential Concern (continued)										
Hexane	—	—	—	X	—	—	X	—	—	—
Methylene chloride	—	—	—	X	—	—	—	X	X	—
Toluene	—	—	X	X	X	—	—	X	X	X
o-Xylene	—	—	—	X	—	—	—	—	—	—
Styrene	—	—	—	X	X	—	—	—	—	X
Xylenes (total)	—	—	—	X	—	—	—	—	—	—
Aldrin	—	—	X	—	—	—	—	—	—	—
beta-BHC	—	—	—	X	—	—	X	X	—	—
Gamma-BHC (Lindane)	—	—	—	X	—	—	—	—	—	—
Aroclor-1254	X	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	—	X	—	—	—	X	—	—

*In Letter 11-TPD-020, "Organic Analyses Optimization for Waste Management Area (WMA) C," a recommendation was made to eliminate analysis of polychlorinated biphenyl congeners in further WMA C sampling activities, but continue to perform analyses of polychlorinated biphenyl Aroclors. This recommendation was approved by the State of Washington Department of Ecology [Letter 11-NWP-053, "Re: Organic Analyses Optimization for Waste Management Area (WMA) C"]. Therefore, no individual congener evaluation was performed in this baseline risk assessment.

3.1.2 Exposure Assessment

The exposure assessment component of the RA typically identifies the populations that may be exposed, the routes by which these receptors may become exposed, and the magnitude, frequency, and duration of potential exposures. The end product of the exposure assessment is a measure of chemical intake as an average daily intake that integrates the exposure parameters for the receptors of concern (e.g., contact rates, exposure frequency, and duration) with EPCs for the media of concern. These average daily intakes are then used in conjunction with chemical-specific toxicity values (e.g., reference doses and cancer slope factors) to arrive at an estimate of potential health risks.

The exposure assessment was performed in two steps: 1) development of a CSM, and 2) quantification of exposure concentrations and pathway-specific intakes.

3.1.2.1 Development of Conceptual Site Model for the Site. The CSM is formulated according to EPA guidance, and information on contaminant sources, release mechanisms, routes of migration, potential exposure points, potential routes of exposure, and potential receptor groups associated with the site.

An exposure pathway can be described as the physical course that a COPC takes from the point of release to a receptor. The route of exposure is the means by which a COPC enters a receptor. For an exposure pathway to be complete, all of the following components must be present:

- A source;
- A mechanism of chemical release and transport;
- An environmental transport medium;
- A receptor or exposed population;
- An exposure point; and
- An exposure route.

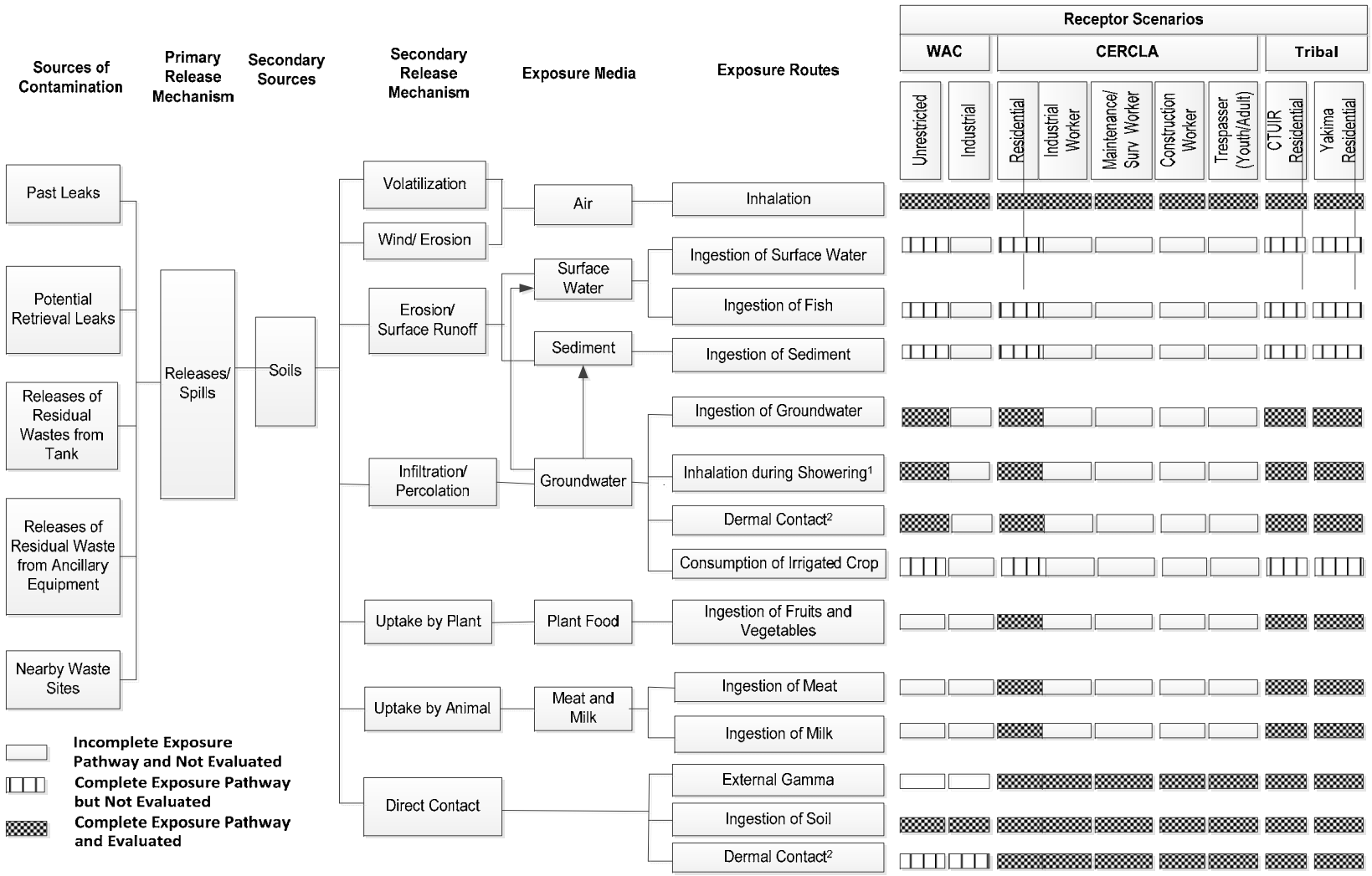
Except for external gamma pathway, all of the following components must be present for a complete exposure pathway. An environmental transport medium is not required for external gamma pathway. In the absence of any one of these components, an exposure pathway is considered incomplete and, therefore, creates no risk or hazard[1]. Figure 3-1 schematically presents five components of the CSM for the HHRA.

3.1.2.2 Contaminant Sources. The five primary sources of contamination in WMA C are 1) residual wastes left in tanks following waste retrieval; 2) residual wastes in ancillary equipment (i.e., diversion boxes and pipelines); 3) contamination in the underlying vadose zone, either from unplanned releases (UPRs) from tanks and/or pipelines or from planned releases (e.g., intentional discharges to French drains); 4) contamination in surface soils from past operations; and 5) possible leaks during future retrieval operations. A complete discussion of primary and secondary contaminant sources is provided in RPP-RPT-47479, *Exposure Scenarios for the Waste Management Area C Performance Assessment*.

This RA addresses contaminants in the underlying vadose zone, either from UPRs from tanks and/or pipelines or from planned releases. It also addresses contamination in surface soils from past operations.

[1] With the exception of external irradiation from radionuclides, environmental contaminants must cross a cellular barrier and enter the body of a receptor for exposure to occur.

Figure 3-1. Human Health Conceptual Site Model for Soil Contamination within Waste Management Area C.



[1] Inhalation during Showering is a complete exposure pathway and will be evaluated for both CTUIR and Yakama Nation Sweat Lodge Uses exposure scenario
[2] Applicable for nonradiological contaminants

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
WAC = *Washington Administrative Code*

3.1.2.3 Release Mechanisms and Environmental Transport Media. The following represent the primary release mechanisms that transport COPCs from their sources, via environmental media, to potential receptors in the vicinity of WMA C:

- Migration of contaminated liquids through the vadose zone column through infiltration, percolation, or leaching
- Direct external radiation exposure from vadose zone material containing radiological COPCs
- Emission of dusts and vapors during former plant operations
- Generation of dust emanating from shallow vadose zone material to ambient air from wind, or during maintenance or excavation activities occurring at WMA C
- Volatilization of COPCs emanating from shallow vadose zone material to ambient air at WMA C.

3.1.2.4 Receptor Scenarios. The exposure assessment evaluates the risk to all receptor populations that are reasonably anticipated to be exposed to COPCs at each EA. Only the reasonable maximum exposure (RME) scenario was evaluated in the HHRA. The exposures may result under current site conditions and from reasonably-anticipated future land uses of the area and the surrounding areas. Exposure scenarios representing both unrestricted and reasonably-anticipated future land uses for WMA C are outlined in RPP-RPT-47479 and were considered during the selection of receptor scenarios evaluated for the WMA C RA.

All current land use activities associated with the Central Plateau are industrial in nature. The facilities located in the Central Plateau processed formerly irradiated fuel from the plutonium production reactors in the 100 Area. Most of the facilities directly associated with fuel reprocessing are now inactive and awaiting final disposition. Several waste management facilities operate in the Central Plateau, including permanent waste disposal facilities such as the Environmental Restoration Disposal Facility, low-level radioactive waste burial grounds, and mixed-waste trenches permitted by RCRA. Since 2002, the Central Plateau also has included construction of a high-level waste treatment facility known as the Waste Treatment Plant. The Integrated Disposal Facility in 200 East Area is the planned disposal location for the vitrified low-activity tank wastes generated by the Waste Treatment Plant. Non-Hanford Site DOE organizations and the U.S. Department of the Navy use the 200 East Area treatment, storage or disposal units. In addition, U.S. Ecology, Inc. operates a commercial low-level radioactive waste disposal facility on a 40-ha (100-ac) tract of land at the southwest corner of the 200 East Area that is leased to Washington State.

The DOE worked for several years with cooperating agencies to define future anticipated land use goals for the Hanford Site. The cooperating agencies and stakeholders included the National Park Service, Tribal Nations, the States of Washington and Oregon, local county and city governments, economic and business development interests, environmental groups, and agricultural interests. A 1992 report, *The Future for Hanford: Uses and Cleanup, The Final*

Report of the Hanford Future Site Uses Working Group (HFSUWG 1992), was an early product of the efforts to develop land use assumptions. The report recognized that the Central Plateau would be used to some degree for waste management activities for the foreseeable future. Following the report, DOE issued DOE/EIS-0222-F, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* and an associated Record of Decision [64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)] in 1999, and the subsequent supplemental analysis (DOE/EIS-0222-SA-01, *Hanford Comprehensive Land-Use Plan Environmental Impact Statement Supplement Analysis*).

It is assumed that the core of the Central Plateau (including the tank farm WMAs) will be under Federal ownership and control for the foreseeable future and managed as an industrial area with restricted access and various institutional controls. However, in addition to evaluating an industrial scenario, the consequences of institutional control failures will be evaluated with several unrestricted land use scenarios.

Based on the current understanding of land use conditions near WMA C, the most plausible exposure pathways for characterizing the human health risks have been identified (represented in Figure 3-1). An adult industrial worker receptor represents reasonably-anticipated future land use conditions, assuming that the Site is maintained as an industrial property. In addition, an adult construction worker, an adult maintenance/surveillance worker, a trespasser adult and a trespasser youth receptor scenario are selected to represent reasonably-anticipated future land use conditions. These receptors may come in contact with contaminated media while working at the Site.

In addition to above RME scenarios, the RA provides additional information for risk management through the evaluation of a residential receptor. The residential scenario is used to evaluate unrestricted land use and determine if remedial alternatives are necessary in the absence of any institutional controls.

Additionally, several local and regional Tribes have ancestral ties to the Hanford Reach of the Columbia River and surrounding lands. As part of the CERCLA process for identifying exposed individuals, DOE has requested that each Tribe provide an exposure scenario that reflects their traditional activities. At this time, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (*Exposure Scenario for CTUIR Traditional Subsistence Lifeways* [Harris and Harper 2004]) and the Yakama Nation ("Yakama Nation Exposure Scenario for Hanford Site Risk Assessment" [Ridolfi, Inc. 2007]) have provided scenarios. Therefore, RAs were performed for both CTUIR and Yakama National scenarios. The DOE requested and invited the Native American perspectives included in this RA to ensure fair consideration of differing views and to inform the decision-making process. The DOE respects those views and has considered them for the purposes of preparing the RFI. However, inclusion of these perspectives does not mean or imply that DOE is in agreement with them.

3.1.2.5 Exposure Scenarios. An exposure pathway is the physical course a contaminant takes from the source to the exposed receptor. The sources evaluated in soil risk assessment include shallow vadose zone material. The shallow vadose zone material is represented by samples

collected from 0 to 4.6 m (0 to 15 ft) bgs. All current and future receptors will be exposed to both radiological and nonradiological COPCs present in the shallow vadose zone.

For radiological constituents, external gamma is an important pathway of exposure and therefore, it was quantified in this evaluation. This pathway is not applicable for nonradiological COPCs.

The scope of this document is limited to evaluation of existing contamination within WMA C and in groundwater up to 100 m downgradient of the WMA. Other documents have analyzed downgradient impacts including DOE/EIS-0391, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington* and the 200-BP-5 and 200-PO-1 remedial investigation documents. When the Hanford Site Composite Analysis is updated, it will also include updated information on these impacts.

Humans routinely ingest small amounts of soil or soil-like materials each day, primarily as a result of hand-to-mouth activity. As a rule, young children ingest greater quantities of such material than do older children and adults. Soil ingestion is frequently an important pathway of exposure and therefore, was quantified in this evaluation.

Dermal contact is also a likely route of exposure to chemicals in environmental media. Dermal contact with soils could result in the absorption of chemicals through the skin; therefore, dermal absorption of chemicals was evaluated in this HHRA. Dermal contact of chemicals was evaluated for CERCLA and Native American receptor scenarios. Due to absence of petroleum products, the dermal contact pathway may be complete but not evaluated for WAC receptor scenarios.

Inhalation exposure may result from inhaling chemicals which have volatilized, as well as radiological contaminated soil particles. Volatile organic compounds are generally those having reported Henry's Law constants greater than 1.0×10^{-5} atmosphere per cubic meter/mole (atm-m^3/mol) and molecular weights less than 200 grams per mole (g/mol). Organic chemical constituents can also exist in air as associated with respirable size particulate matter. These particles can be emitted into the air either by wind erosion or as a result of mechanical disturbance. The inhalation of chemicals in soils was evaluated in this HHRA.

The State of Washington defines groundwater as potable in WAC 173-340-720, subsection (2) "Potable groundwater defined," unless the exclusion criteria in WAC 173-340-720(2)(a) through (c) can be demonstrated (insufficient yield, natural constituents that make it unsuitable as a drinking water source). The groundwater beneath the Central Plateau does not meet the exclusion criteria; therefore, it is classified as potable and must be restored to beneficial use wherever practicable, and within a reasonable time frame. The State of Washington has further determined that the highest beneficial use for potable groundwater, including the potable groundwater at the Hanford Site, is as a potential source of domestic drinking water [WAC 173-340-720, subsection (1) "General considerations," item (a)].

Groundwater beneath the Central Plateau is currently contaminated, and withdrawal is prohibited as a result of institutional controls placed on it by DOE. Under current Site use conditions, there are no complete human or ecological exposure pathways. Further, regardless of land use

designations for soils, groundwater beneath the Central Plateau is not anticipated to become a future source of drinking water until cleanup criteria are met and groundwater is restored to its highest beneficial use. However, groundwater in this risk analysis is evaluated for drinking water use to support the determination of the basis for action and to support the development of preliminary remediation goals (PRGs) for evaluating remedial alternatives. Remediation of contaminated groundwater beneath WMA C is the subject of the remedial investigation/ feasibility study activities underway for the 200-BP-5 Groundwater Operable Unit. As mentioned in Section 1.0, the groundwater pathway is evaluated as a part of 200-BP-5 Operable Unit groundwater RA. Therefore, the groundwater pathway is not evaluated in this RA. However, the soil leaching pathway was evaluated as a part of WAC 173-340 by comparing nonradiological soil concentrations to applicable MTCA soil cleanup levels to identify measured site concentrations that are not protective of human health and analytes that could be of potential concern for WMA C.

The nearest surface water body to WMA C is West Lake 5, which is located about 5 km to the north from WMA C. Based on observed and projected groundwater conditions at WMA C and within the 200 East Area, West Lake is assumed to be upgradient from WMA C. The next closest surface water body is the Columbia River, which is located 11 km to the east of WMA C. The Columbia River is downgradient from WMA C from a groundwater perspective. The impacts of waste left within WMA C on these surface water bodies will be evaluated through the use of a regional fate and transport model. This evaluation will be completed in the Hanford Site Cumulative Impacts Evaluation. DOE/RL-2018-69, *Cumulative Impact Evaluation Technical Approach Document*, Draft A, provides more detailed information regarding the regional fate and transport model for the Cumulative Impacts Evaluation. Even though surface water and sediment pathways may be complete for WAC receptors, CERCLA residential and Native American scenarios, these will not be evaluated in this RA.

Food chain pathways were evaluated for unrestricted residential receptors and Native American resident scenarios. Food chain pathways include consumption of homegrown produce (e.g., fruits and vegetables), meat (beef and poultry) and milk and egg products. Food chain pathways were evaluated for radiological COPCs. They were not evaluated for nonradiological COPCs as EPA does not provide intake equations or recommend performing food chain analyses for chemicals (EPA/540/1-89/002). Even though consumption of irrigated crops may be completed for WAC receptor, CERCLA residential, and Native American scenarios, these will not be evaluated in this RA.

The receptor scenarios along with their corresponding exposure pathways are summarized in the following subsections. Under the HFFACO, the tank farm corrective action process is subject to both CERCLA and RCRA requirements; therefore, the RA includes scenarios based on both Federal (CERCLA) and State (2013 WAC 173-340-700, “Overview of Cleanup Standards,” through WAC 173-340-7490, “Terrestrial Ecological Evaluation Procedures”) guidance and regulations. The CERCLA-based scenarios evaluate both radiological and nonradiological contaminants of concern whereas the WAC-based scenarios evaluate only nonradiological COPCs.

3.1.2.5.1 CERCLA Industrial Worker. The industrial worker is selected as the receptor to represent potential exposures from industrial land use similar to that experienced in the Inner Area of the Central Plateau. The receptor could potentially be exposed to shallow vadose zone material and will be at the site for 250 days per year for 25 years (EPA/540/R-92/003; Memorandum OSWER Directive 9200.1-120, "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factor"). The industrial worker spends two hours per day outdoors and six hours per day indoors. An incidental soil ingestion rate of 50 milligrams of soil per day (mg/day), an inhalation rate of 20 cubic meter per day (m^3/day), a skin surface area of 3,470 square centimeters (cm^2) (includes face, hands, and forearms) and a soil adherence factor of 0.12 mg/cm^2 was assumed (EPA/540/1-89/002, EPA/540/R-92/003). Since workers are assumed to be adults, a body weight of 80 kilograms (kg) was used to assess exposure to chemical constituents (Memorandum OSWER Directive 9200.1-120).

Exposure pathways evaluated for the industrial worker scenario include:

- External gamma radiation from radionuclides in the shallow vadose soil;
- Incidental ingestion of shallow vadose soil;
- Inhalation of airborne contaminated dust or volatile emissions from soil; and
- Dermal exposure from nonradiological COPCs.

3.1.2.5.2 WAC Industrial Worker Scenario Based on Model Toxics Control Act Method C Standard. Typically, soil concentrations of nonradiological COPCs are evaluated against the soil cleanup levels established in the 2013 WAC 173-340-745 to identify COPCs that do not meet the soil cleanup standards. However, during this baseline RA, instead of comparing soil concentration to their respective cleanup levels, an additional RA was performed for nonradiological COPCs by utilizing the equations (rearranged to solve for risk) and exposure assumptions presented in 2013 MTCA Method C [WAC 173-340-745, subsection (5) "Method C industrial soil cleanup levels," item (b); WAC 173-340-750, "Cleanup Standards to Protect Air Quality," subsection (4) "Method C air cleanup levels," item (b)]. The results of the RAs were compared against the acceptable risk levels, established in WAC 173-340-745. The MTCA Standard Method C soil cleanup levels are based on exposure to an adult receptor, include incidental soil ingestion, and use industrial exposure frequency and duration assumptions. The MTCA Standard Method C air cleanup levels are based on exposure to an adult receptor, include inhalation of vapors and dust in ambient air, and assume industrial exposure frequency and duration assumptions. Therefore, exposure pathways evaluated for MTCA Method C industrial worker scenario include:

- Incidental soil ingestion, and
- Inhalation of vapors and dust in ambient air.

Attachment A-1 of Appendix A includes the default assumptions for the exposure parameters.

3.1.2.5.3 CERCLA Construction Worker Scenario. Under reasonably-anticipated future land use conditions, construction workers could potentially be exposed to soil up to 15 ft bgs. The construction worker is assumed to have short-term exposure to soil while performing trenching and excavation activities on the Central Plateau. Construction workers are assumed to

be on the job eight hours per day, 30 days per year over a one-year period. During a typical working day, the construction worker is assumed to spend eight hours outdoors and will ingest 330 mg of soil (OSWER 9355.4-24; EPA-540-R-03-001, *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil*). The skin surface area of 3,300 cm^2 (based on exposure of face, hands, and forearms) and a soil adherence factor of 0.3 mg/cm^2 were selected for the worker (OSWER 9355.4-24; EPA-540-R-03-001). The inhalation rate for the receptor is 20 m^3 per day (EPA/540/R-92/003). Since construction workers are assumed to be adults, a body weight of 80 kg was used to assess exposure to chemical constituents.

Exposure pathways evaluated for the construction worker scenario include:

- external gamma radiation from radionuclides in the soil,
- incidental ingestion of soil,
- inhalation of airborne contaminated dust or volatile emissions from soil, and
- dermal exposure to nonradiological COPCs.

3.1.2.5.4 CERCLA Maintenance/Surveillance Worker Scenario. This scenario assumes that adult maintenance and surveillance workers (authorized users) could potentially be exposed to soil up to 15 ft bgs within the Inner Area of the Central Plateau. The scenario assumes that exposure to soil occurs while performing waste site surveillance activities such as walk downs and visual inspections as well as activities such as mowing the grass, clearing brush, and general site maintenance. It is likely that activity would be greater in the summer and less in the winter, but the yearly average is 136 times a year. The exposure duration for the maintenance worker is assumed to be 25 years, the same as that for the industrial worker. The maintenance worker is assumed to spend eight hours per day outdoors. It assumes an incidental soil ingestion rate of 100 mg/day, an inhalation rate of 20 m^3/day, a skin surface area of 3,300 cm^2 (includes face, hands, and forearms), and a skin adherence factor of 0.1 mg/cm^2 (OSWER 9355.4-24, EPA/540/R/99/005). The soil adherence factor of 0.1 mg/cm^2-event represents the 95th percentile value for grounds keepers (Exhibit 3-3, Activity Specific-Surface Area Weighted Soil Adherence Factors in EPA/540/R-99/005).

Exposure pathways evaluated for the maintenance and surveillance workers scenario include:

- external gamma radiation from radionuclides in the soil,
- incidental ingestion of soil,
- inhalation of airborne contaminated dust or volatile emissions from soil, and
- dermal exposure to nonradiological COPCs.

3.1.2.5.5 CERCLA Adult and Older Youth Trespasser Scenario. The Trespasser exposure scenario for radiological and nonradiological analytes is used to represent reasonably-anticipated future land use conditions. This scenario assumes that older youth and adults could trespass within the Inner Area of the Central Plateau and could potentially be exposed to the shallow vadose zone soil. The scenario assumes that exposure to surface soil occurs from infrequent unauthorized off-road activities such as dirt bike riding, mountain bike riding, or hiking.

An adult would gain unauthorized access to the site a total of 2 days per month during those months that weather permits (2 days per month over 8 months per year) for a total of 16 days per year over a 24-year exposure duration. It assumes an incidental soil ingestion rate of 100 mg/day, an inhalation rate of 20 m^3/day, a skin surface area of 5,700 cm^2 (includes head, hands, forearms, and lower legs), and a skin adherence factor of 0.07 mg/cm^2 (OSWER 9355.4-24, EPA/540/R/99/005).

The older youth trespasser is assumed to range in age from 10 to 16 years, resulting in a 7-year exposure duration. An average body weight for boys and girls ranging in age between 10 and 16 years is assumed to be 50 kg. The youth would gain access to the site a total of nine days per month during those months that weather permits (9 days per month over 8 months per year) for a total of 72 days per year. It assumes an incidental soil ingestion rate of 100 mg/day, an inhalation rate of 10 m^3/day, a skin surface area of 2,800 cm^2 (includes head, hands, forearms, lower legs, and feet), and a skin adherence factor of 0.12 mg/cm^2 (EPA/540/R/99/005).

The exposure pathways for adult and older youth trespasser include:

- external gamma radiation from radionuclides in the soil,
- incidental ingestion of soil,
- inhalation of airborne contaminated dust or volatile emissions from soil, and
- dermal exposure to nonradiological COPCs.

3.1.2.5.6 CERCLA Residential Scenario. The residential scenario for radiological and nonradiological analytes is based on a residential setting and represents the “all pathways” exposure scenario for this RA. The potentially exposed population for this exposure scenario includes adult and child residents.

For exposure to shallow vadose zone material, an exposure frequency of 350 days per year, over a 26-year exposure duration (6 years for a child plus 20 years for an adult) is assumed for the residential exposure scenarios. An incidental ingestion rate of 100 mg/day for adults and 200 mg/day for children, an inhalation rate of 20 m^3/day for adults and 10 m^3/day for children, and a skin surface area of 6,032 cm^2 for adults (head, hands, forearms, and lower legs) and 2,690 cm^2 for children (head, hands, forearms, lower legs, and feet), and a skin adherence factor of 0.07 mg/cm^2 for adults and 0.12 mg/cm^2 for children were assumed (EPA/540/1-89/002, EPA/540/R-92/003, OSWER Directive 9285.6-03, Memorandum OSWER Directive 9200.1-120).

The exposure pathways for residential receptor include:

- external gamma radiation from radiological COPCs in the soil,
- incidental ingestion of soil for both radiological and nonradiological COPCs,
- inhalation of airborne contaminated dust or volatile emissions from soil,
- dermal exposure to nonradiological COPCs,
- fruits, vegetables and grain consumptions pathways for radiological COPCs,
- meat consumption pathway for radiological COPCs, and
- milk consumption pathway for radiological COPCs.

3.1.2.5.7 WAC Residential Scenario Based on Model Toxics Control Act Method B Standard. Typically, soil concentrations of nonradiological COPCs are evaluated against the soil cleanup levels established in the 2013 WAC 173-340-740 to identify COPCs that do not meet the soil cleanup standards under unrestricted land use. However, instead of comparing soil concentrations with respect to their cleanup standards, an RA was performed for nonradiological COPCs based on the equations (rearranged to solve for risk) and exposure assumptions presented in MTCA Standard WAC 173-340-740, subsection (3) "Method B Soil Cleanup Levels for Unrestricted Land Use" and Standard WAC 173-340-750, subsection (3) "Method B Air Cleanup Levels." The results of the assessments were compared against the acceptable risk levels established by the MTCA Method B Standard.

The MTCA Standard Method B soil cleanup levels are based on exposure to a child receptor that includes incidental ingestion and use residential exposure frequency and duration assumptions. The MTCA Standard Method B air cleanup levels are based on exposure to a child and adult receptor, include inhalation of vapors and dust in ambient air, and assume residential exposure frequency and duration assumptions. Therefore, by utilizing exposure scenarios, the RA was performed as follows:

- soil ingestion pathway for residential child, and
- inhalation vapors and dust in ambient air from soil for child and adult.

Residential adult and child were considered for carcinogenic and noncarcinogenic COPCs, respectively, for the inhalation pathway. Default assigned values for exposure parameters under Method B cleanup levels were utilized during this RA. Attachment A-1 of Appendix A includes the default assumptions for the exposure parameters.

3.1.2.5.8 Tribal Scenarios. Two Tribal scenarios are also considered during this RA. The CTUIR and Yakama Nation receptors scenarios reflect exposure conditions if the land use within the Central Plateau were released for traditional Native American activities. These scenarios and receptors are not consistent with the anticipated future land use within the Inner Area of the Central Plateau but are evaluated to assist interested parties in providing input on the remedial alternatives as part of the CERCLA modifying criteria.

Both the CTUIR and Yakama Nation exposure scenarios consider an evaluation of external gamma radiation, incidental soil ingestion, and inhalation of dust particulates for the direct contact pathway. These scenarios also include exposure from food chain pathways, including consumption of fruits and vegetables grown in a backyard garden and consumption of beef and poultry that graze on and are penned on a pasture, and consumption of milk.

Appendix A, Attachment A-1 presents the assigned values for exposure parameters related to each receptor scenario, used during nonradiological RAs. Appendix A, Attachment A-2 presents those assigned values for exposure parameters to each receptor scenario in the radiological RA.

3.1.2.6 Quantification of Exposure Point Concentrations. To calculate a cancer risk or a non-cancer hazard, an EPC must be derived to reflect the chemical concentration in the environmental medium to which an individual may be exposed. OSWER 9285.6-10 states that

"This concentration, commonly termed the exposure point concentration (EPC), is a conservative estimate of the average chemical concentration in an environmental medium." OSWER Publication 9285.7-08I, *Supplemental Guidance to RAGS: Calculating the Concentration Term* states that "Because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable." Use of the 95% upper confidence limit (UCL) of the arithmetic mean yields risk estimates that correspond to an RME. Instances where a value different from a UCL is used as the EPC are clearly identified and the reasons and/or justifications for the departure are provided in this RA.

OSWER 9285.6-10 further states the following:

> *The EPC is determined for each individual exposure unit within a site. An exposure unit is the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure. Unless there is site-specific evidence to the contrary, an individual receptor is assumed to be equally exposed to media within all portions of the exposure unit over the time frame of the risk assessment.*

OSWER 9285.6-10 is the most recent EPA guidance for UCL calculation, and ProUCL 4.00.05 serves as the companion software package for this guidance. ProUCL software was developed by Lockheed Martin Environmental Services, Las Vegas, Nevada, under a contract with the U.S. Environmental Protection Agency, Office of Research and Development, National Exposure Research Laboratory, Environmental Sciences Division and is made available through the EPA Technical Support Center in Las Vegas, Nevada. This statistical software package is designed to provide statistical calculations in support of RA activities. It is distributed free of charge and made available for download at http://www.epa.gov/nerlesd1/tsc/TSC_form.htm.

ProUCL 4.00.05 contains rigorous parametric and nonparametric statistical methods (including bootstrap methods) that can be used on data sets without non-detect results and on data sets with non-detect results (results reported below detection limits). OSWER 9285.6-10 recommends using a distributional method for computing UCLs if the data can be shown to reasonably fit a specific distribution. Distribution-free or nonparametric methods are applied if reasonable assumptions about the data distribution cannot be made.

For the WMA C RA, the non-detect sample results for nonradiological contaminants were used directly within the ProUCL software as non-detected values at the specified detection limit. For radiological contaminants, reporting results for both non-detect and detected sample results were used by the ProUCL software during the calculation of the 95% UCL. No substitution was used for radiological sample results. In addition to sample results, the analyte-specific detected and non-detect sample results were also designated as 1 and 0, respectively, to represent the detection status for each sample result within the ProUCL input files. Additional descriptions related to those methods are presented in Section 6.1 of RPP-RPT-57218, *Computation of Exposure Point Concentrations for Waste Management Area C Phase 2 Soil Characterization Data*.

During this RA, the EPC for each COPC within each EA was selected by implementing the logic presented in Ecology's Letter related to the calculation of the EPCs (Letter 16-NWP-130, "Re: 200-SW-2 Radioactive Landfills Group Operable Unit RCRA Facility Investigation/Corrective Measures Study/Remedial Investigation/Feasibility Study Work Plan, DOE/RL-2004-60, Revision 1"). According to the logic:

> *The highest "suggested UCL to use" provided in the ProUCL output file shall be used as the EPC unless the software provides a warning indicating that the "recommended UCL exceeds maximum observation". When this warning is provided, or when ProUCL cannot calculate a UCL value or does not provide a "suggested UCL to use", the maximum observed concentration will be used as the EPC.*

ProUCL 4.00.05 was used to calculate the EPCs for each EA; a summary of these EPCs is provided in Table 3-2. A more recent version of ProUCL (5.1) was also used to calculate the EPCs for each EA; these results are presented in Appendix I.

3.1.2.7 Quantification of Contaminant of Potential Concern Intake/Absorption. The magnitude of human exposure to chemicals in environmental media is usually described in terms of the average daily intake, which is the amount of chemical in contact with exchange surfaces of the body (e.g., skin, lungs, gastrointestinal tract). The specific formulas used to calculate pathway-specific average daily intake for both nonradiological and radiological COPCs are presented in more detail below.

3.1.2.7.1 CERCLA Intake/Absorption Equations for Nonradiological Contaminants of Potential Concern. Incidental ingestion of soils was estimated for COPCs by the following equation:

$$\textit{Intake (mg / kg - day)} = \frac{C_s \times IR_s \times EF \times ED \times CF}{BW \times AT}$$

Where:

C_s = constituent concentration in soils (mg/kg)
IR_s = ingestion rate (mg/day)
EF = exposure frequency (days/year)
ED = exposure duration (years)
CF = conversion factor (10^{-6} kg/mg)
BW = body weight (kg)
AT = averaging time (days).

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area A + B								
Nonradiological Contaminants of Potential Concern								
Aluminum	8	8	100	µg/kg	6,710,000	7,860,000	7,549,337	95% Student's-t UCL
Antimony	8	8	100		114	342	265	95% Student's-t UCL
Arsenic	8	8	100		2,400	5,220	3,751	95% Approximate Gamma UCL
Barium	8	8	100		66,100	100,000	85,003	95% Student's-t UCL
Cadmium	8	8	100		39.3	117	96.7	95% Student's-t UCL
Chromium[1]	8	8	100		5,970	11,100	9,537	95% Student's-t UCL
Cobalt	8	8	100		6,470	11,400	9,094	95% Approximate Gamma UCL
Copper	8	8	100		10,800	14,200	12,756	95% Student's-t UCL
Fluoride	8	4	50		717	2,750	2,225	95% KM (Percentile Bootstrap) UCL
Iron	8	8	100		21,200,000	26,200,000	24,080,312	95% Student's-t UCL
Lead	8	8	100		2,920	7,210	5,722	95% Student's-t UCL
Lithium	8	8	100		7,100	8,640	8,332	95% Student's-t UCL
Manganese	8	8	100		299,000	377,000	354,006	95% Student's-t UCL
Nickel	8	8	100		7,530	12,200	10,843	95% Student's-t UCL
Nitrate	8	6	75		1,710	16,100	9,063	95% KM (t) UCL
Nitrite	8	4	50		342	1,080	925	95% KM (Percentile Bootstrap) UCL
Silver	8	8	100		28.6	52.5	48.3	95% Student's-t UCL
Strontium	8	8	100		30,100	45,000	37,739	95% Student's-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area A + B (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Tin	3	3	100	µg/kg	6,900	11,600	11,600	Maximum Detect
Total Uranium[2]	8	8	100		408	732	577	95% Student's-t UCL
Vanadium	8	8	100		48,300	66,500	59,975	95% Student's-t UCL
Zinc	8	8	100		41,200	47,500	45,590	95% Student's-t UCL
Diethylphthalate	4	1	25		340	340	340	Maximum Detect
Aroclor-1254	7	2	28.57		6.5	8.6	7.5	95% KM (t) UCL
Radiological Contaminants of Potential Concern								
Americium-241	8	3	37.5	pCi/g	0.038	0.18	0.18	95% KM (Percentile Bootstrap) UCL
Carbon-14	8	3	37.5		1.2	3.4	3.4	95% KM (Percentile Bootstrap) UCL
Cesium-137	8	2	25		4.4	27.7	27.7	95% KM (BCA) UCL
Plutonium-239/240	8	1	12.5		0.31	0.31	0.31	Maximum Detect
Plutonium-241	8	1	12.5		1.2	1.2	1.2	Maximum Detect
Selenium-79	8	2	25		2.2	2.7	2.4	95% KM (t) UCL
Strontium-90	8	2	25		11.8	24	17.1	95% KM (t) UCL
Tin-126	8	8	100		14.1	47	31.7	95% Student's-t UCL
Uranium-234	8	7	87.5		0.17	0.33	0.26	95% KM (t) UCL
Uranium-235	8	8	100		0.006	0.011	0.0089	95% Student's-t UCL
Uranium-238	8	8	100		0.14	0.24	0.19	95% Student's-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area C								
Nonradiological Contaminants of Potential Concern								
Aluminum	3	3	100	µg/kg	8,270,000	9,510,000	9,510,000	Maximum Detect
Antimony	3	3	100		175	721	721	Maximum Detect
Arsenic	3	3	100		3,810	21,200	21,200	Maximum Detect
Barium	3	3	100		81,500	98,800	98,800	Maximum Detect
Beryllium	3	3	100		323	403	403	Maximum Detect
Cadmium	3	3	100		94.9	150	150	Maximum Detect
Chromium[1]	3	3	100		9,290	12,800	12,800	Maximum Detect
Cobalt	3	3	100		9,010	11,000	11,000	Maximum Detect
Copper	3	3	100		13,200	18,100	18,100	Maximum Detect
Fluoride	3	3	100		557	2,290	2,290	Maximum Detect
Iron	3	3	100		22,800,000	28,600,000	28,600,000	Maximum Detect
Lead	3	3	100		3,710	10,600	10,600	Maximum Detect
Lithium	3	3	100		7,800	12,100	12,100	Maximum Detect
Manganese	3	3	100		373,000	449,000	449,000	Maximum Detect
Mercury	3	2	66.67		3.9	5.1	5.1	Maximum Detect
Nickel	3	3	100		10,800	13,000	13,000	Maximum Detect
Nitrate	3	3	100		4,210	17,400	17,400	Maximum Detect
Nitrite	3	3	100		1,180	2,110	2,110	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area C (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Silver	3	3	100	µg/k	40	80	80	Maximum Detect
Strontium	3	3	100		33,100	44,700	44,700	Maximum Detect
Total Uranium[2]	3	3	100		540	845	845	Maximum Detect
Vanadium	3	3	100		49,000	78,500	78,500	Maximum Detect
Zinc	3	3	100		44,600	51,100	51,100	Maximum Detect
Butylbenzyl phthalate	3	1	33.33		80.7	80.7	80.7	Maximum Detect
Radiological Contaminants of Potential Concern								
Cesium-137	3	1	33.33	pCi/g	7.1	7.1	7.1	Maximum Detect
Nickel-63	3	1	33.33		4.5	4.5	4.5	Maximum Detect
Strontium-90	3	1	33.33		3	3	3	Maximum Detect
Tin-126	3	3	100		20.7	53.1	53.1	Maximum Detect
Uranium-235	3	3	100		0.0083	0.013	0.013	Maximum Detect
Uranium-238	3	3	100		0.18	0.28	0.28	Maximum Detect
Exposure Area E								
Nonradiological Contaminants of Potential Concern								
Aluminum	4	4	100	µg/kg	6,810,000	7,420,000	7,420,000	Maximum Detect
Antimony	4	4	100		92.6	178	178	Maximum Detect
Arsenic	4	4	100		2,990	5,200	5,200	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area E (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Barium	4	4	100	µg/kg	75,000	78,400	78,400	Maximum Detect
Beryllium	4	4	100		147	159	159	Maximum Detect
Boron	4	2	50		3,250	3,340	3,340	Maximum Detect
Cadmium	4	4	100		2,700	3,260	3,260	Maximum Detect
Chromium[1]	4	4	100		7,980	17,200	17,200	Maximum Detect
Cobalt	4	4	100		7,620	8,820	8,820	Maximum Detect
Copper	4	4	100		12,000	16,500	16,500	Maximum Detect
Fluoride	4	4	100		995	1,480	1,480	Maximum Detect
Iron	4	4	100		21,600,000	24,200,000	24,200,000	Maximum Detect
Lithium	4	4	100		7,030	9,130	9,130	Maximum Detect
Manganese	4	4	100		298,000	495,000	495,000	Maximum Detect
Mercury	4	1	25		23.2	23.2	23.2	Maximum Detect
Nickel	4	4	100		7,820	12,400	12,400	Maximum Detect
Nitrate	4	4	100		2,850	5,020	5,020	Maximum Detect
Nitrite	4	4	100		724	1,400	1,400	Maximum Detect
Selenium	4	4	100		210	560	560	Maximum Detect
Silver	4	4	100		66.7	85	85	Maximum Detect
Strontium	4	4	100		28,900	34,700	34,700	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area E (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Total Uranium[2]	4	4	100	µg/kg	570	827	827	Maximum Detect
Vanadium	4	4	100		50,000	58,800	58,800	Maximum Detect
Zinc	4	4	100		39,800	44,800	44,800	Maximum Detect
Acetone	4	3	75		4.1	6.6	6.6	Maximum Detect
Butylbenzyl phthalate	4	3	75		121	124	124	Maximum Detect
Toluene	4	4	100		0.23	0.34	0.34	Maximum Detect
Aldrin	4	1	25		2	2	2	Maximum Detect
Radiological Contaminants of Potential Concern								
Cesium-137	4	1	25	pCi/g	5.1	5.1	5.1	Maximum Detect
Selenium-79	4	4	100		1.6	3.8	3.8	Maximum Detect
Strontium-90	4	1	25		2.5	2.5	2.5	Maximum Detect
Tin-126	4	4	100		3.8	18.5	18.5	Maximum Detect
Uranium-233	4	4	100		1.6	2	2	Maximum Detect
Uranium-234	4	3	75		0.19	0.45	0.45	Maximum Detect
Uranium-235	4	4	100		0.0083	0.012	0.012	Maximum Detect
Uranium-236	4	1	25		0.0012	0.0012	0.0012	Maximum Detect
Uranium-238	4	4	100		0.19	0.28	0.28	Maximum Detect
Selenium-79	4	4	100		1.6	3.8	3.8	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area E (continued)								
Radiological Contaminants of Potential Concern (continued)								
Strontium-90	4	1	25	pCi/g	2.5	2.5	2.5	Maximum Detect
Tin-126	4	4	100		3.8	18.5	18.5	Maximum Detect
Uranium-233	4	4	100		1.6	2	2	Maximum Detect
Uranium-234	4	3	75		0.19	0.45	0.45	Maximum Detect
Uranium-235	4	4	100		0.0083	0.012	0.012	Maximum Detect
Uranium-236	4	1	25		0.0012	0.0012	0.0012	Maximum Detect
Uranium-238	4	4	100		0.19	0.28	0.28	Maximum Detect
Exposure Area F + G								
Nonradiological Contaminants of Potential Concern								
Aluminum	8	8	100	µg/kg	4,480,000	7,440,000	6,760,835	95% Student's-t UCL
Antimony	8	4	50		120	262	247	95% KM (Percentile Bootstrap) UCL
Arsenic	8	8	100		1,920	4,300	3,488	95% Student's-t UCL
Barium	8	8	100		40,600	129,000	94,105	95% Student's-t UCL
Beryllium	8	3	37.5		185	298	298	95% KM (Percentile Bootstrap) UCL
Cadmium	8	6	75		73.3	143	117	95% KM (t) UCL
Chromium[1]	8	8	100		4,740	9,720	8,977	95% Student's-t UCL
Cobalt	8	8	100		5,360	8,760	8,183	95% Student's-t UCL
Copper	8	8	100		10,100	15,600	13,030	95% Student's-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area F + G (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Fluoride	8	8	100	µg/kg	695	3,290	2,112	95% Approximate Gamma UCL
Iron	8	8	100		15,200,000	25,900,000	23,947,828	95% Student's-t UCL
Lead	8	6	75		3,370	8,480	6,159	95% KM (t) UCL
Lithium	8	8	100		3,350	7,910	7,427	95% Student's-t UCL
Manganese	8	8	100		229,000	500,000	386,286	95% Student's-t UCL
Mercury	8	1	12.5		30.4	30.4	30.4	Maximum Detect
Nickel	8	8	100		6,400	12,400	11,253	95% Student's-t UCL
Nitrate	8	8	100		3,250	11,400	7,154	95% Modified-t UCL
Nitrite	8	8	100		1,180	4,080	3,059	95% Student's-t UCL
Silver	8	2	25		70.7	81.8	81.8	Maximum Detect
Strontium	8	8	100		21,700	49,700	36,178	95% Student's-t UCL
Tin	1	1	100		6,360	6,360	6,360	Maximum Detect
Total Uranium[2]	8	8	100		396	1,019	715	95% Modified-t UCL
Vanadium	8	8	100		31,600	78,500	69,739	95% Student's-t UCL
Zinc	8	8	100		28,500	43,100	38,336	95% Student's-t UCL
2-Butanone	8	2	25		2.5	2.5	2.5	95% KM (t) UCL
Bis(2-ethylhexyl) phthalate	8	4	50		667	7,420	4,033	95% KM (Percentile Bootstrap) UCL
Butylbenzylphthalate	8	2	25		48.8	72.6	59.2	95% KM (t) UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area F + G (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Hexane	4	4	100	µg/kg	2.1	35.9	35.9	Maximum Detect
Methylene chloride	8	3	37.5		2	2	2	Maximum Detect
o-Xylene	8	1	12.5		0.13	0.13	0.13	Maximum Detect
Styrene	4	4	100		0.25	0.65	0.65	Maximum Detect
Toluene	8	3	37.5		0.24	1	1	95% KM (Percentile Bootstrap) UCL
Xylenes (total)	8	1	12.5		0.46	0.46	0.46	Maximum Detect
Gamma-BHC (Lindane)	2	1	50		5.1	5.1	5.1	Maximum Detect
beta-BHC	5	4	80		21.3	25.3	25.2	95% KM (Percentile Bootstrap) UCL
Aroclor-1260	8	1	12.5		20.6	20.6	20.6	Maximum Detect
Radiological Contaminants of Potential Concern								
Carbon-14	8	3	37.5	pCi/g	3.5	12.5	12.5	95% KM (Percentile Bootstrap) UCL
Cesium-137	8	2	25		2.1	4.8	3.2	95% KM (t) UCL
Selenium-79	8	1	12.5		2.4	2.4	2.4	Maximum Detect
Strontium-90	8	2	25		0.3	0.3	0.3	95% KM (Percentile Bootstrap) UCL
Tin-126	8	1	12.5		2.6	2.6	2.6	Maximum Detect
Uranium-233	8	8	100		0.62	2.2	1.5	95% Student’s-t UCL
Uranium-234	8	5	62.5		0.18	0.42	0.3	95% KM (Percentile Bootstrap) UCL
Uranium-235	8	8	100		0.0058	0.015	0.01	95% Modified-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area F + G (continued)								
Radiological Contaminants of Potential Concern (continued)								
Uranium-236	8	2	25	pCi/g	0.0013	0.0013	0.0013	95% KM (t) UCL
Uranium-238	8	8	100		0.13	0.34	0.24	95% Modified-t UCL
Exposure Area H + I								
Nonradiological Contaminants of Potential Concern								
Aluminum	8	8	100	µg/kg	4,590,000	7,730,000	7,005,174	95% Student's-t UCL
Antimony	8	8	100		77.9	420	256	95% Student's-t UCL
Arsenic	8	8	100		2,000	7,000	5,020	95% Student's-t UCL
Barium	8	8	100		71,000	103,000	90,474	95% Student's-t UCL
Beryllium	8	7	87.5		136	212	199	95% KM (t) UCL
Cadmium	8	8	100		66.1	196	137	95% Student's-t UCL
Chromium[1]	8	8	100		5,340	26,800	16,797	95% Approximate Gamma UCL
Cobalt	8	8	100		6,680	11,300	10,181	95% Student's-t UCL
Copper	8	8	100		9,970	13,500	12,194	95% Student's-t UCL
Fluoride	8	8	100		372	2,100	1,657	95% Student's-t UCL
Iron	8	8	100		14,300,000	31,200,000	26,088,701	95% Student's-t UCL
Lead	8	8	100		2,460	11,300	7,819	95% Student's-t UCL
Lithium	8	8	100		3,560	8,010	7,563	95% Student's-t UCL
Manganese	8	8	100		270,000	465,000	408,047	95% Student's-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area H + I (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Molybdenum	8	2	25	µg/kg	1,980	2,000	2,000	95% KM (Percentile Bootstrap) UCL
Nickel	8	8	100		6,610	18,300	13,083	95% Student's-t UCL
Nitrate	8	8	100		2,750	54,600	32,443	95% Approximate Gamma UCL
Nitrite	8	7	87.5		232	1,850	1,299	95% KM (t) UCL
Selenium	8	8	100		523	1,000	983	95% Student's-t UCL
Silver	8	4	50		59.1	66.7	65.5	95% KM (t) UCL
Strontium	8	8	100		20,200	37,700	33,393	95% Student's-t UCL
Total Uranium[2]	8	8	100		471	578	545	95% Student's-t UCL
Vanadium	8	8	100		24,500	82,600	66,149	95% Student's-t UCL
Zinc	8	8	100		29,500	53,000	44,785	95% Student's-t UCL
Butylbenzylphthalate	8	1	12.5		200	200	200	Maximum Detect
Di-n-butylphthalate	8	1	12.5		570	570	570	Maximum Detect
Styrene	8	7	87.5		0.27	0.46	0.39	95% KM (t) UCL
Toluene	8	7	87.5		0.27	1.1	0.62	95% KM (BCA) UCL
Radiological Contaminants of Potential Concern								
Carbon-14	8	1	12.5	pCi/g	3.5	3.5	3.5	Maximum Detect
Selenium-79	8	2	25		2.2	2.7	2.7	95% KM (Percentile Bootstrap) UCL
Tin-126	8	7	87.5		3.4	9.8	7.7	95% KM (t) UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area H + I (continued)								
Radiological Contaminants of Potential Concern (continued)								
Tritium	8	4	50	pCi/g	2.9	75.8	75.8	Maximum Detect
Uranium-233	8	8	100		0.58	2	1.6	95% Student's-t UCL
Uranium-234	8	3	37.5		0.26	0.35	0.35	95% KM (Percentile Bootstrap) UCL
Uranium-235	8	8	100		0.0064	0.0081	0.0078	95% Student's-t UCL
Uranium-236	8	3	37.5		0.0014	0.0021	0.0021	95% KM (Percentile Bootstrap) UCL
Uranium-238	8	8	100		0.16	0.19	0.18	95% Student's-t UCL
Exposure Area J								
Nonradiological Contaminants of Potential Concern								
Aluminum	3	3	100	µg/kg	6,890,000	7,740,000	7,740,000	Maximum Detect
Antimony	3	3	100		219	2,160	2,160	Maximum Detect
Arsenic	3	3	100		3,270	7,890	7,890	Maximum Detect
Barium	3	3	100		77,800	244,000	244,000	Maximum Detect
Beryllium	3	3	100		134	328	328	Maximum Detect
Boron	3	3	100		5,610	43,900	43,900	Maximum Detect
Cadmium	3	3	100		84	113	113	Maximum Detect
Chromium[1]	3	3	100		9,580	11,600	11,600	Maximum Detect
Cobalt	3	3	100		6,340	8,270	8,270	Maximum Detect
Copper	3	3	100		12,100	13,800	13,800	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area J (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Fluoride	3	3	100	µg/kg	502	1,530	1,530	Maximum Detect
Iron	3	3	100		18,700,000	24,100,000	24,100,000	Maximum Detect
Lead	3	3	100		4,900	5,290	5,290	Maximum Detect
Lithium	3	3	100		7,300	8,680	8,680	Maximum Detect
Manganese	3	3	100		287,000	383,000	383,000	Maximum Detect
Mercury	3	2	66.67		11.5	16.2	16.2	Maximum Detect
Nickel	3	3	100		10,200	13,700	13,700	Maximum Detect
Nitrate	3	3	100		3,240	9,230	9,230	Maximum Detect
Nitrite	3	3	100		1,220	2,500	2,500	Maximum Detect
Silver	3	3	100		57.7	62.4	62.4	Maximum Detect
Strontium	3	3	100		33,100	125,000	125,000	Maximum Detect
Tin	2	2	100		3,030	3,600	3,600	Maximum Detect
Total Uranium[2]	3	3	100		572	650	650	Maximum Detect
Vanadium	3	3	100		41,900	54,300	54,300	Maximum Detect
Zinc	3	3	100		34,300	52,300	52,300	Maximum Detect
Bis(2-ethylhexyl) phthalate	3	1	33.33		2,070	2,070	2,070	Maximum Detect
Butylbenzylphthalate	3	1	33.33		77.8	77.8	77.8	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area J (continued)								
Radiological Contaminants of Potential Concern								
Carbon-14	3	1	33.33	pCi/g	13.7	13.7	13.7	Maximum Detect
Cesium-137	3	1	33.33		5.7	5.7	5.7	Maximum Detect
Plutonium-238	3	1	33.33		0.067	0.067	0.067	Maximum Detect
Plutonium-239/240	3	1	33.33		0.038	0.038	0.038	Maximum Detect
Plutonium-241	3	1	33.33		0.14	0.14	0.14	Maximum Detect
Selenium-79	3	3	100		3.8	11.3	11.3	Maximum Detect
Strontium-90	3	1	33.33		4	4	4	Maximum Detect
Uranium-235	3	3	100		0.0083	0.01	0.01	Maximum Detect
Uranium-238	3	3	100		0.19	0.22	0.22	Maximum Detect
Cesium-137	3	1	33.33		5.7	5.7	5.7	Maximum Detect
Plutonium-238	3	1	33.33		0.067	0.067	0.067	Maximum Detect
Plutonium-239/240	3	1	33.33		0.038	0.038	0.038	Maximum Detect
Plutonium-241	3	1	33.33		0.14	0.14	0.14	Maximum Detect
Selenium-79	3	3	100		3.8	11.3	11.3	Maximum Detect
Strontium-90	3	1	33.33		4	4	4	Maximum Detect
Uranium-235	3	3	100		0.0083	0.01	0.01	Maximum Detect
Uranium-238	3	3	100		0.19	0.22	0.22	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area L1 + L2								
Nonradiological Contaminants of Potential Concern								
Aluminum	7	7	100	µg/kg	5,110,000	7,070,000	6,397,264	95% H-UCL
Antimony	8	5	62.5		74.1	500	269	95% KM (t) UCL
Arsenic	8	8	100		1,800	4,520	3,599	95% Student's-t UCL
Barium	8	8	100		46,600	106,000	83,446	95% Student's-t UCL
Beryllium	8	4	50		111	216	164	95% KM (t) UCL
Cadmium	8	8	100		32.3	120	95.6	95% Student's-t UCL
Chromium[1]	8	8	100		7,540	11,100	9,678	95% Student's-t UCL
Cobalt	8	8	100		4,340	10,700	8,260	95% Student's-t UCL
Copper	8	8	100		8,020	15,100	12,175	95% Student's-t UCL
Fluoride	8	8	100		379	1,660	1,264	95% Student's-t UCL
Iron	8	8	100		12,600,000	25,900,000	21,064,334	95% Student's-t UCL
Lead	8	8	100		3,040	6,430	5,312	95% Student's-t UCL
Lithium	8	8	100		5,550	7,440	7,069	95% Student's-t UCL
Manganese	8	8	100		169,000	450,000	355,885	95% Student's-t UCL
Mercury	8	2	25		10.2	17.1	17.1	95% KM (Percentile Bootstrap) UCL
Molybdenum	8	2	25		2,260	2,450	2,450	95% KM (Percentile Bootstrap) UCL
Nickel	8	8	100		7,330	18,400	13,132	95% Student's-t UCL
Nitrate	8	8	100		1,920	12,000	7,684	95% Approximate Gamma UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area L1 + L2 (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Nitrite	8	6	75	µg/kg	1,250	5,180	3,100	95% KM (t) UCL
Selenium	8	1	12.5		1,350	1,350	1,350	Maximum Detect
Silver	8	4	50		52	102	94	95% KM (Percentile Bootstrap) UCL
Strontium	8	8	100		19,000	33,300	31,005	95% Student's-t UCL
Total Uranium[2]	8	8	100		318	980	688	95% Student's-t UCL
Vanadium	8	8	100		32,000	71,600	59,115	95% H-UCL
Zinc	8	8	100		24,200	43,400	38,009	95% Student's-t UCL
Acetone	8	1	12.5		46.2	46.2	46.2	Maximum Detect
1-Butanol	8	1	12.5		22.2	22.2	22.2	Maximum Detect
Bis(2-ethylhexyl) phthalate	8	1	12.5		1,840	1,840	1,840	Maximum Detect
Butylbenzylphthalate	8	2	25		53.6	59.2	59.2	95% KM (Percentile Bootstrap) UCL
Hexane	4	4	100		20.2	60.5	60.5	Maximum Detect
beta-BHC	8	4	50		19.4	23.4	22.7	95% KM (Percentile Bootstrap) UCL
Radiological Contaminants of Potential Concern								
Carbon-14	8	3	37.5	pCi/g	4.7	53.8	53.8	95% KM (Percentile Bootstrap) UCL
Cesium-137	8	3	37.5		0.44	7.5	3.5	95% KM (t) UCL
Nickel-63	8	1	12.5		390	390	390	Maximum Detect
Selenium-79	8	1	12.5		1.6	1.6	1.6	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area L1 + L2 (continued)								
Radiological Contaminants of Potential Concern (continued)								
Strontium-90	8	3	37.5	pCi/g	0.12	4	2	95% KM (t) UCL
Tin-126	8	2	25		3.4	8.9	8.9	95% KM (Percentile Bootstrap) UCL
Tritium	8	1	12.5		4.7	4.7	4.7	Maximum Detect
Uranium-233	8	8	100		0.44	2.1	1.5	95% Student's-t UCL
Uranium-234	8	5	62.5		0.14	0.29	0.25	95% KM (Percentile Bootstrap) UCL
Uranium-235	8	8	100		0.0047	0.014	0.01	95% Student's-t UCL
Uranium-236	8	1	12.5		0.0013	0.0013	0.0013	Maximum Detect
Uranium-238	8	8	100		0.11	0.33	0.23	95% Student's-t UCL
Exposure Area P								
Nonradiological Contaminants of Potential Concern								
Aluminum	10	10	100	µg/kg	5,650,000	7,800,000	7,128,284	95% Student's-t UCL
Antimony	10	3	30		174	367	235	95% KM (t) UCL
Arsenic	10	10	100		1,790	5,900	5,064	95% Student's-t UCL
Barium	10	10	100		66,100	86,100	81,503	95% Student's-t UCL
Beryllium	10	6	60		191	315	276	95% KM (Percentile Bootstrap) UCL
Cadmium	10	10	100		76.8	145	121	95% Student's-t UCL
Chromium[1]	10	10	100		4,470	21,800	12,404	95% Approximate Gamma UCL
Cobalt	10	10	100		6,370	9,900	9,157	95% Student's-t UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area P (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Copper	10	10	100	µg/kg	11,300	13,200	12,769	95% Student's-t UCL
Fluoride	9	9	100		1,340	4,760	2,873	95% Approximate Gamma UCL
Iron	10	10	100		20,000,000	30,500,000	25,306,987	95% Student's-t UCL
Lead	10	10	100		2,930	8,060	7,803	95% Approximate Gamma UCL
Lithium	10	10	100		4,190	9,420	8,366	95% Student's-t UCL
Manganese	10	10	100		291,000	385,000	364,282	95% Student's-t UCL
Mercury	10	1	10		19.2	19.2	19.2	Maximum Detect
Nickel	10	10	100		6,710	13,900	11,109	95% Student's-t UCL
Nitrate	9	9	100		3,700	17,500	11,436	95% Student's-t UCL
Nitrite	9	8	88.89		1,670	5,760	4,608	95% KM (t) UCL
Silver	10	7	70		100	223	177	95% KM (Percentile Bootstrap) UCL
Strontium	10	10	100		26,300	39,100	33,142	95% Approximate Gamma UCL
Tin	4	4	100		7,750	14,400	14,400	Maximum Detect
Total Uranium[2]	10	10	100		581	2,634	1,568	95% Student's-t UCL
Vanadium	10	10	100		56,700	110,000	77,756	95% Modified-t UCL
Zinc	10	10	100		39,500	305,000	183,424	95% Chebyshev (Mean, Sd) UCL
Acetone	11	7	63.64		4.2	13.1	9.8	95% KM (Percentile Bootstrap) UCL
Bis(2-ethylhexyl) phthalate	8	2	25		804	2,300	2,300	95% KM (Percentile Bootstrap) UCL

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area P (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Di-n-butylphthalate	8	1	12.5	µg/kg	863	863	863	Maximum Detect
Methylene chloride	11	3	27.27		0.8	2.6	1.3	95% KM (t) UCL
Toluene	11	1	9.09		0.29	0.29	0.29	Maximum Detect
beta-BHC	4	4	100		21.2	25.8	25.8	Maximum Detect
Aroclor-1260	8	2	25		25.2	26.8	26.8	95% KM (Percentile Bootstrap) UCL
Radiological Contaminants of Potential Concern								
Americium-241	11	1	9.09	pCi/g	2.2	2.2	2.2	Maximum Detect
Cesium-137	10	7	70		0.33	73.1	32.1	95% KM (Percentile Bootstrap) UCL
Cobalt-60	10	1	10		0.83	0.83	0.83	Maximum Detect
Iodine-129	11	1	9.09		0.81	0.81	0.81	Maximum Detect
Neptunium-237	10	1	10		1.5	1.5	1.5	Maximum Detect
Nickel-63	11	1	9.09		85	85	85	Maximum Detect
Plutonium-239/240	11	1	9.09		10.7	10.7	10.7	Maximum Detect
Plutonium-241	11	1	9.09		39.9	39.9	39.9	Maximum Detect
Selenium-79	11	7	63.64		2	8.7	4.6	95% KM (t) UCL
Strontium-90	11	8	72.73		2.2	141	82.2	95% KM (Percentile Bootstrap) UCL
Technetium-99	10	1	10		24	24	24	Maximum Detect
Tritium	10	1	10		308	308	308	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area P (continued)								
Radiological Contaminants of Potential Concern (continued)								
Uranium-233	10	10	100	pCi/g	0.75	2.6	1.9	95% Student's-t UCL
Uranium-234	10	9	90		0.15	1.4	0.72	95% KM (BCA) UCL
Uranium-235	10	10	100		0.0082	0.043	0.025	95% Student's-t UCL
Uranium-236	10	9	90		0.0026	0.056	0.029	95% KM (t) UCL
Uranium-238	10	10	100		0.19	0.88	0.52	95% Student's-t UCL
Exposure Area R								
Nonradiological Contaminants of Potential Concern								
Aluminum	3	3	100	µg/kg	6,770,000	8,390,000	8,390,000	Maximum Detect
Antimony	2	2	100		161	245	245	Maximum Detect
Arsenic	3	3	100		4,900	5,830	5,830	Maximum Detect
Barium	3	3	100		66,800	79,200	79,200	Maximum Detect
Beryllium	3	3	100		156	175	175	Maximum Detect
Cadmium	3	3	100		2,990	3,470	3,470	Maximum Detect
Chromium[1]	3	3	100		9,250	11,200	11,200	Maximum Detect
Cobalt	3	3	100		8,370	10,500	10,500	Maximum Detect
Copper	3	3	100		11,000	14,800	14,800	Maximum Detect
Fluoride	3	3	100		964	3,530	3,530	Maximum Detect
Iron	3	3	100		22,100,000	25,900,000	25,900,000	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area R (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Lead	3	3	100	µg/kg	4,310	8,450	8,450	Maximum Detect
Lithium	3	3	100		7,290	9,050	9,050	Maximum Detect
Manganese	3	3	100		331,000	409,000	409,000	Maximum Detect
Mercury	3	1	33.33		13.5	13.5	13.5	Maximum Detect
Nickel	3	3	100		8,690	11,000	11,000	Maximum Detect
Nitrate	3	3	100		6,710	39,700	39,700	Maximum Detect
Nitrite	3	2	66.67		387	5,310	5,310	Maximum Detect
Selenium	3	3	100		594	701	701	Maximum Detect
Silver	3	3	100		51.9	69.4	69.4	Maximum Detect
Strontium	3	3	100		29,900	37,300	37,300	Maximum Detect
Total Uranium[2]	3	3	100		471	660	660	Maximum Detect
Vanadium	3	3	100		55,600	64,200	64,200	Maximum Detect
Zinc	3	3	100		45,300	48,600	48,600	Maximum Detect
2-Hexanone	3	3	100		2.1	2.8	2.8	Maximum Detect
Acetone	4	2	50		2.5	6.4	6.4	Maximum Detect
Butylbenzylphthalate	3	2	66.67		76.1	107	107	Maximum Detect
Methylene chloride	4	1	25		1.4	1.4	1.4	Maximum Detect
Toluene	4	3	75		0.32	0.59	0.59	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area R (continued)								
Radiological Contaminants of Potential Concern								
Strontium-90	1	1	100	pCi/g	0.37	0.37	0.37	Maximum Detect
Tritium	2	1	50		2.5	2.5	2.5	Maximum Detect
Uranium-233	3	3	100		1.8	2.4	2.4	Maximum Detect
Uranium-234	3	2	66.67		0.21	0.22	0.22	Maximum Detect
Uranium-235	3	3	100		0.0067	0.01	0.01	Maximum Detect
Uranium-238	3	3	100		0.16	0.22	0.22	Maximum Detect
Exposure Area U								
Nonradiological Contaminants of Potential Concern								
Aluminum	3	3	100	µg/kg	4,960,000	8,270,000	8,270,000	Maximum Detect
Antimony	3	3	100		151	291	291	Maximum Detect
Arsenic	3	3	100		3,000	7,000	7,000	Maximum Detect
Barium	3	3	100		48,100	96,900	96,900	Maximum Detect
Benzene	4	1	25		0.33	0.33	0.33	Maximum Detect
Beryllium	3	3	100		126	235	235	Maximum Detect
Boron	1	1	100		6,420	6,420	6,420	Maximum Detect
Chromium[1]	3	3	100		7,460	10,000	10,000	Maximum Detect
Cobalt	3	3	100		5,540	8,730	8,730	Maximum Detect
Copper	3	3	100		9,080	13,200	13,200	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area U (continued)								
Nonradiological Contaminants of Potential Concern (continued)								
Fluoride	3	3	100	µg/kg	402	2,020	2,020	Maximum Detect
Iron	3	3	100		15,500,000	23,100,000	23,100,000	Maximum Detect
Lead	3	3	100		3,000	7,000	7,000	Maximum Detect
Lithium	3	3	100		5,520	9,240	9,240	Maximum Detect
Manganese	3	3	100		226,000	364,000	364,000	Maximum Detect
Mercury	3	2	66.67		10.2	20.6	20.6	Maximum Detect
Molybdenum	3	2	66.67		2,380	2,530	2,530	Maximum Detect
Nickel	3	3	100		6,680	9,800	9,800	Maximum Detect
Nitrate	3	3	100		6,590	8,510	8,510	Maximum Detect
Nitrite	3	3	100		671	2,190	2,190	Maximum Detect
Selenium	3	3	100		1,000	2,000	2,000	Maximum Detect
Strontium	3	3	100		23,000	49,600	49,600	Maximum Detect
Total Uranium[2]	3	3	100		354	618	618	Maximum Detect
Vanadium	3	3	100		38,800	51,900	51,900	Maximum Detect
Zinc	3	3	100		28,500	45,300	45,300	Maximum Detect
Acetone	4	2	50		6	6.2	6.2	Maximum Detect
Styrene	1	1	100		0.38	0.38	0.38	Maximum Detect
Toluene	4	4	100		0.56	0.74	0.74	Maximum Detect

Table 3-2. Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Pathway at Each Exposure Area. (24 sheets)

Analyte	Total Samples	Total Detects	FOD (%)	Units	Detection Result		EPC	Basis for EPC
					Minimum	Maximum		
Exposure Area U (continued)								
Radiological Contaminants of Potential Concern								
Carbon-14	3	1	33.33	pCi/g	1.7	1.7	1.7	Maximum Detect
Cesium-137	3	1	33.33		2.1	2.1	2.1	Maximum Detect
Neptunium-237	3	1	33.33		0.6	0.6	0.6	Maximum Detect
Selenium-79	3	1	33.33		2.8	2.8	2.8	Maximum Detect
Strontium-90	3	1	33.33		4.2	4.2	4.2	Maximum Detect
Tin-126	3	3	100		3.8	6.3	6.3	Maximum Detect
Uranium-233	3	3	100		0.77	2.1	2.1	Maximum Detect
Uranium-234	3	3	100		0.19	0.31	0.31	Maximum Detect
Uranium-235	3	3	100		0.0056	0.0089	0.0089	Maximum Detect
Uranium-236	3	1	33.33		0.0016	0.0016	0.0016	Maximum Detect
Uranium-238	3	3	100		0.12	0.21	0.21	Maximum Detect

EPC = Exposure Point Concentration FOD = Frequency of Detection UCL = upper confidence limit

[1] All chromium analytical results for the Waste Management Area C soil data sets were assumed to be in the form of hexavalent chromium.

[2] Even though uranium concentrations for all Exposure Areas are less than its background concentration, as a conservative approach, it was retained as a contaminant of potential concern.

For inhalation, exposure concentration (EC) of each COPC was calculated as follows:

$$EC = (CA \times ET \times EF \times ED) / (AT \times CF)$$

Where:

EC	=	exposure concentration (micrograms per cubic meter [$\mu g/m^3$])
CA	=	constituent concentration in air ($\mu g/m^3$)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (days) (ED in years × 365 days/year)
CF	=	conversion factor (24 hours/day).

The COPC's concentration in air was calculated based on chemical concentration in soils as follows:

$$CA\ (\mu g/m^3) = C_S \times CF \times (VF^{-1} + PEF^{-1})$$

Where:

C_S	=	constituent EPC in soils (mg/kg)
CF	=	conversion factor (10^3 micrograms per milligram [µg/mg])
VF	=	volatilization factor (constituent-specific cubic meter [m^3]/kg)
PEF	=	particulate emission factor (m^3/kg).

Average daily chemical intake for the dermal absorption of chemicals in soil was calculated by use of the following formula (EPA/540/1-89/002):

$$AD_{Derm} = \frac{C_S \times CF \times SA \times AF \times ABS \times SCT \times EF \times ED}{BW \times AT}$$

Where:

AD_{Derm}	=	average daily absorbed chemical dose (mg/kg/day)
C_S	=	chemical concentration in soil (mg/kg), as represented as the EPC
CF	=	conversion factor (10^{-6} kg/mg)
SA	=	skin surface area available for contact (square centimeter [cm^2])
AF	=	soil to skin adherence factor (milligrams per square centimeter [mg/cm^2])
ABS	=	absorption factor (unitless)
SCT	=	soil contact time; fraction of day soil remains on skin (unitless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days).

3.1.2.7.2 Model Toxics Control Act Intake Equations for Nonradiological Contaminants of Potential Concern. Equations 740-1 and 740-2 in WAC 173-340-740 are utilized to determine the noncarcinogenic and carcinogenic soil cleanup levels, respectively, for the

ingestion pathway under unrestricted land use scenarios. Equations 745-1 and 745-2 in WAC 173-340-745 are utilized to determine noncarcinogenic and carcinogenic soil cleanup levels under industrial land use scenarios, respectively. During this baseline RA, instead of determining cleanup levels, first average daily intake was calculated by using the assigned values presented for unrestricted and industrial land use scenarios. The result of the intake for each nonradiological COPC was then multiplied by their corresponding toxicity value to perform forward RAs. The modified intake equation due to incidental ingestion of soils is presented below:

$$\textit{Intake (mg / kg - day)} = \frac{C_s \times IR_s \times CF \times ABI \times EF \times ED}{BW \times AT}$$

Where:

C_s = constituent concentration in soils (mg/kg)
IR_s = ingestion rate (mg-day)
CF = conversion factor (10^{-6} kg/mg)
ABI = gastrointestinal absorption fraction (unitless)
EF = exposure frequency (unitless)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (years).

Equations 750-1 and 750-2 in WAC 173-340-745 are utilized to determine the noncarcinogenic and carcinogenic soil cleanup levels, respectively, for the inhalation pathway under both unrestricted and industrial land use scenarios. However, during this baseline RA, instead of determining cleanup levels, first average daily intake due to inhalation pathway was calculated by using the assigned values presented for unrestricted and industrial land use scenarios. Intake due to inhalation of vapors and dust in ambient air was estimated under MTCA Method B and Method C by using the following equation:

$$\textit{Intake (mg / kg - day)} = \frac{C_A \times BR \times EF \times ED \times CF}{BW \times AT}$$

Where:

C_A = constituent concentration in air (µg/m^3)
BR = breathing rate (m^3/day)
EF = exposure frequency (unitless)
ED = exposure duration (years)
CF = conversion factor (10^{-3} mg/µg)
BW = body weight (kg)
AT = averaging time (years).

3.1.2.7.3 Quantification of Radiological Contaminant of Potential Concern Intake/Absorption. The human health radiological dose and RA for radiological COPCs was conducted by utilizing the RESidual RADioactivity computer code (RESRAD) Version 6.5 (ANL 2009a). Developed by Argonne National Laboratory for DOE, the RESRAD model is

typically used to estimate the potential dose and risk to the average member of the critical group for unrestricted land use based on site-specific and generic parameters. The RESRAD model calculates risk from both water-independent and water-dependent pathways. The water-independent pathways include external radiation, inhalation, ingestion of plants (water-independent component), soil, meat and milk. The water-dependent pathways include ingestion of water, fish, meat, milk and plants (from irrigation water-dependent component). The risks from both pathways are combined together to calculate the total risk. RESRAD Version 6.5 utilizes EPA 402-R-99-001, *Federal Guidance Report No. 13, Cancer Risk Coefficients for Environmental Exposure to Radionuclides* includes the risk coefficient values for all radionuclides (ANL 2009a). The risk coefficients derived in EPA 402-R-99-001 are based on methods and models that take into account the age- and gender-dependence of radionuclide intake, metabolism, dosimetry, radiogenic risk, and competing causes of death in estimating the cancer risk from low-level exposures to radionuclides in the environment. These risk coefficient slope factors are presented in units per pCi (internal pathways) or risk per year per pCi/g (external pathways).

3.1.3 Toxicity Assessment

This toxicity assessment evaluates the relationship between the magnitude of exposure to a contaminant at WMA C and the likelihood of adverse health effects to potentially exposed populations. This assessment provides, where possible, a numerical estimate of the increased likelihood of adverse effects associated with contaminant exposure. Toxicity assessments for both nonradiological and radiological COPCs are summarized below.

3.1.3.1 Toxicity Assessment for Nonradiological Contaminants of Potential Concern. The toxic effects of a chemical generally depend not only upon the inherent toxicity of the chemical and the level of exposure (intake), but also on the route of exposure (oral, inhalation, or dermal) and the duration of exposure. Thus, a full description of toxic effects of a chemical includes a listing of what adverse health effects the chemical may cause, and how the occurrence of these effects depend upon intake, route, and duration of exposure.

3.1.3.2 Carcinogenic Evaluation Methodology. When data permit, EPA derives numeric values that are useful in quantifying the toxicity and carcinogenicity of a compound. For cancer health effects, the numeric descriptors of carcinogenic potency are Slope Factors (SFs). These are route-specific estimates of the slope of the cancer dose-response curve at low doses. The units of the SFs are $(mg/kg\text{-}day)^{-1}$. In addition, EPA assigns a cancer weight-of-evidence category to each chemical in order to reflect the overall confidence that the chemical is likely to cause cancer in humans. These categories and their meanings are summarized below (EPA/540/1-89/002).

Carcinogenic Category	Meaning	Basis
A	Known human carcinogen.	Sufficient evidence of increased cancer in exposed humans.

Carcinogenic Category	Meaning	Basis
B1	Probable human carcinogen.	Suggestive evidence (limited data) of increased cancer incidence in exposed humans.
B2	Probable human carcinogen.	Sufficient evidence of increased cancer incidence in animals, but lack of data or insufficient data from humans.
C	Possible human carcinogen.	Suggestive evidence of carcinogenicity in animals.
D	Cannot be evaluated.	No evidence or inadequate evidence of cancer in animals or humans.

Presently, toxicological data do not exist from which dermal SFs can be derived. To evaluate the dermal pathway, EPA has adopted methodology to obtain dermal SFs by adjusting the oral SFs (EPA/540/R-99/005). The equation for extrapolation of a default dermal SF is as follows:

$$\text{Default Dermal SF} = \frac{\text{Oral SF}}{\text{Oral Absorption Factor (fraction)}}$$

Oral absorption factors used in this HHRA are obtained from EPA/540/R-99/005.

For the inhalation pathway for the CERCLA receptors, cancer toxicity values are expressed in terms of the unit risk, having the units of (µg chemical/m^3 of air)$^{-1}$. However, for the inhalation pathway for the WAC receptors, cancer toxicity values are expressed in terms of the inhalation SF, having the units of (mg chemical/kg body weight per day)$^{-1}$. The toxicity values for the carcinogenic nonradiological COPCs evaluated in WMA C are summarized in Appendix B, Table B-1.

3.1.3.3 Noncarcinogenic Evaluation Methodology. For non-cancer health effects, the toxicity values are reference doses (RfDs). These are route- and duration-specific estimates of the average daily intake (mg chemical/kg-day) that may occur without appreciable risk of any adverse effect. Because the quality and quantity of toxicological data available to support derivation of RfD values vary among chemicals, EPA also provides an indication of the overall confidence associated with each RfD value. In general, the lower the confidence, the more conservative EPA is in deriving the RfD.

Oral RfDs are derived from toxicological data and can be easily obtained from EPA toxicological databases. However, for the inhalation pathway, non-cancer reference values are expressed in terms of the reference concentration (RfC), having the units of mg chemical/m^3 of air. Oral RfDs were adjusted to derive dermal RfDs in an approach similar to that described above for the derivation of dermal SFs, and as follows:

$$\text{Dermal RfD} = \text{Oral RfD} \times \text{Oral Absorption Factor (fraction)}$$

Oral absorption factors used in this HHRA are obtained from EPA/540/R-99/005. The toxicity values for the noncarcinogenic nonradiological COPCs evaluated in WMA C are summarized in Appendix B, Table B-1.

3.1.3.4 Sources for Nonradiological Contaminants of Potential Concern Toxicity Values. The analyte-specific toxicity values presented in Appendix B, Table B-1 are determined using the following recommended reference hierarchy, as described in Memorandum OSWER Directive 9285.7-53, "Human Health Toxicity Values in Superfund Risk Assessments."

- Tier 1: EPA Integrated Risk Information System (IRIS) database – The preferred source of toxicity data is EPA's IRIS database. Expert toxicologists at EPA have derived the values in this database and the values have undergone a thorough review and validation both within and outside EPA. If a toxicity value is available in IRIS, that value is preferred to any other value.

- Tier 2: EPA Provisional Peer Reviewed Toxicity Values – If a toxicity value is not available in IRIS, the next source is EPA's provisional peer-reviewed toxicity values. This source includes toxicity values that have been developed by the Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center. These values are also published in the regional screening levels.

- Tier 3: Other Toxicity Values – Tier 3 includes additional EPA and non-EPA sources of toxicity information, including the following.

    - The California Environmental Protection Agency's Toxicity Criteria Database contains toxicity values that are peer reviewed and address both cancer and non-cancer effects.

    - Agency for Toxic Substances and Disease Registry database, Minimal Risk Levels for Hazardous Substances are peer-reviewed estimates of the daily human exposure to hazardous substances that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure.

    - Toxicity values in EPA 540-R-97-036, *Health Effects Assessment Summary Tables: FY 1997 Update*.

The toxicity values for all chemicals found in The Risk Assessment Information System, Queried 10/2014, http://rais.ornl.gov/ were considered during the toxicity assessment for this RA.

A derived RfD for nitrate was calculated from the RfD reported in IRIS (1.6 mg/kg-day) for nitrate as nitrogen (NO_3-N) using the mass fraction of nitrogen in nitrate. The mass fraction of nitrogen in nitrate = mol wt N/mol wt NO_3^- = (14 g/mol)/(62 g/mol) = 0.226. The derived RfD for nitrate = (1.6 mg NO_3 - N/kg-day) × (1 mg NO_3^-/0.226 mg NO_3-N) = 7.1 mg NO_3-/kg-day.

A derived RfD for nitrite was calculated from the RfD reported in IRIS (0.1 mg/kg-day) for nitrite as nitrogen (NO_2-N) using the mass fraction of nitrogen in nitrite. The mass fraction of nitrogen in nitrite = mol wt N/mol wt NO_2^- = (14 g/mol)/(46 g/mol) = 0.304. The derived RfD for nitrite = (0.1 mg NO_2-N/kg-day) × (1 mg NO_2^-/0.304 mg NO_2-N) = 0.3 mg NO_2^-/kg-day.

For Cr(VI), the current assessment considers cancer effects only for inhalation exposures. Note that an oral RfD and a reference concentration are available for assessment of non-cancer effects. An oral cancer slope factor has recently been published by the New Jersey Department of Environmental Protection (NJDEP). The oral cancer slope factor derived by NJDEP is 0.5 $(mg/kg\text{-}day)^{-1}$ ("Derivation of an Ingestion-Based Soil Remediation Criterion for Cr^{+6} Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate" [Stern 2009]). Risk due to ingestion pathway was not considered as its oral toxicity value, developed by NJDEP, is still being evaluated by IRIS. Assessing only inhalation cancer effects from Cr(VI) has the potential to under-estimate cancer risk.

3.1.3.5 Toxicity Assessment for Radiological Contaminants of Potential Concern. To estimate radiological risk, the RESRAD code utilizes EPA 402-R-99-001 risk coefficient values. The risk coefficients derived in EPA 402-R-99-001 are based on methods and models that take into account the age- and gender-dependence of radionuclide intake, metabolism, dosimetry, radiogenic risk, and competing causes of death in estimating the cancer risk from low-level exposures to radionuclides in the environment. These risk coefficient slope factors are presented in units per pCi (internal pathways) or risk per year per pCi/g (external pathways). The dose coefficient factors and risk coefficient factors for radiological COPCs are presented in Attachment B-2 of Appendix B.

3.1.4 Risk Characterization Methods

Risk characterization is completed by combining the results of the exposure assessment (estimated chemical intakes) with the results of the dose-response assessment (toxicity values established in the toxicity assessment) to provide quantification of excess cancer risk and non-cancer hazard. To characterize potential carcinogenic effects, probabilities that an individual will develop cancer over a lifetime of exposure are estimated from projected intakes and chemical-specific dose response information. To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. The methods for risk characterization used in this HHRA evaluation are based upon guidance provided in EPA/540/1-89/002 and WAC 173-340 and they are summarized below.

3.1.4.1 Risk Characterization for Nonradiological Contaminants of Potential Concern. The risk characterization for nonradiological COPCs is summarized below. Nonradiological COPCs have both carcinogenic and noncarcinogenic toxicity values. Therefore, both carcinogenic risk and non-cancer hazard evaluation were performed for nonradiological COPCs.

3.1.4.1.1 Carcinogenic Risk Characterization. The objective of the risk characterization for carcinogenic chemicals is to derive an estimate of overall excess cancer risk associated with exposure to potential carcinogens at a site. The risk of cancer from exposure to a chemical is described in terms of the probability that an individual exposed for his or her entire lifetime will

develop cancer by age 70. For each COPC, this value is calculated by multiplying the average daily intake of the chemical, for ingestion and dermal contact, by the SF for the chemical/route, as follows:

$$CR = DI \times SF$$

Where:
CR = cancer risk (unitless)
DI = daily intake of chemical (mg/kg-day)
SF = cancer slope factor $(mg/kg\text{-}day)^{-1}$.

For inhalation exposure, the carcinogenic risk is calculated by multiplying the EC of the chemical by the unit risk for the chemical, as follows:

$$CR = EC \times IUR$$

Where:
EC = exposure concentration, $(\mu g/m^3)$
IUR = inhalation unit risk, $(\mu g/m^3)^{-1}$.

Cancer risks are presented as increased excess lifetime cancer risk (ELCR), which is not a specific estimate of expected cancers. Rather, it is a plausible upper-bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to site chemical contaminants under the assumed exposure scenario. Although synergistic or antagonistic interactions might occur between cancer-causing contaminants and other chemicals, information is generally lacking in the toxicological literature to predict quantitatively the effects of these potential interactions. Therefore, cancer risks are treated as additive within an exposure route in this assessment. This is consistent with EPA guidelines on chemical mixtures (EPA/630/R-00/004, *Guidelines for Carcinogen Risk Assessment*). For estimating the cancer risks from exposure to multiple carcinogens from a single exposure route, the following equation is used:

$$Risk_T = \sum_1^N Risk_i$$

Where:
$Risk_T$ = total cancer risk from route of exposure
$Risk_i$ = cancer risk for the ith chemical
N = number of chemicals.

Total cancer risk for each EA is calculated by summing the ELCRs across carcinogenic chemicals and exposure routes.

3.1.4.1.2 Non-Cancer Hazard Characterization. The objective of the hazard characterization for noncarcinogenic chemicals is to compare the estimated intake for a constituent to the level of intake that is recognized as unlikely to result in adverse noncarcinogenic health effects. The potential for non-cancer hazards from ingestion and dermal

exposure to a constituent is derived by dividing the estimated intake of the constituent over a specific time period by the RfD for that constituent, derived for a similar exposure period. This comparison results in a non-cancer hazard quotient (HQ), derived as follows:

$$HQ = \frac{DI}{RfD}$$

Where:

HQ = hazard quotient (unitless)
DI = daily chemical intake (mg/kg-day)
RfD = non-cancer reference dose (mg/kg-day).

For inhalation pathway, non-cancer hazard is calculated as follows:

$$HQ = EC / (RfC \times 1{,}000\ \mu g/mg)$$

Where:

EC = exposure concentration, $\mu g/m^3$
RfC = non-cancer reference concentration, mg/m^3.

Hazard quotients are calculated independently for each chemical evaluated. To assess the potential for non-cancer effects posed by exposure to multiple chemicals, a Hazard Index (HI) approach was used in accordance with EPA/540/1-89/002. This approach assumes that the non-cancer hazard associated with exposure to more than one chemical is additive; therefore, synergistic or antagonistic interactions between chemicals are not accounted for. Since exposure occurs simultaneously to more than one chemical, HQ values may be summed, resulting in an overall HI. The non-cancer hazard, HI, for each EA is calculated by summing the HQs across chemicals and exposure routes. When HI>1, the chemicals may be segregated by similar mechanisms of action (critical effect) and toxicological effects, and corresponding HQs are summed within a similar mechanism of action and across exposure routes. It should be noted that the effect(s) and mechanism(s) of action for each chemical are obtained by using the hierarchy as stated in Section 3.1.3.4. If toxicity and mechanism information is available in IRIS, that other toxicity and mechanism information beyond IRIS will not be considered and evaluated. Appendix C includes nonradiological RAs for various receptor scenarios presented in Section 3.2.

3.1.4.1.3 Risk Characterization for Lead. Lead, a non-carcinogen, is considered a special case for risk characterization. The traditional RfD approach to the evaluation of chemicals is not applied to lead because most human health effects data are based on blood lead concentrations, rather than external dose. Blood lead concentration is an integrated measure of internal dose, reflecting total exposure from site-related and background sources. A clear No-Observed-Adverse-Effects-Level (NOAEL) has not been established for such lead-related endpoints as birth weight, gestation period, heme synthesis and neurobehavioral development in children and fetuses, and blood pressure in middle-aged men. Dose-response curves for these endpoints appear to extend down to 10 micrograms per deciliter (µg/dl) or lower [*Toxicological Profile for Lead (Update)* (ATSDR 2007)]. The EPA guidance suggests that non-cancer effects from

human exposure to lead-contaminated media be evaluated by using the Integrated Exposure Uptake Biokinetic Model (IEUBK Model), for children's exposure [EPA 9285.7-42, *User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows®*, 540-K-01-005][2], and the Adult Lead Model for adult exposure (more specifically, for estimating fetal blood lead levels in women exposed to lead containing soil under non-residential scenarios) (EPA-540-R-03-001).

For WMA C, the maximum detected concentration (11.3 mg/kg) for lead was detected in EA H+I. The MTCA Method A cleanup standard for lead under unrestricted land use is 250 mg/kg. As the maximum detected concentration for lead is less than 5% of the soil cleanup standard, no risk characterization was performed for lead in this RA.

3.1.4.2 Risk Characterization for Radiological Contaminants of Potential Concern. As mentioned in Section 3.1.2.7.3, RESRAD 6.5 was used to perform the radiological RAs for each EA. Radiological COPCs have carcinogenic toxicity values. Therefore, RESRAD 6.5 was used to calculate cumulative ELCRs for each EA. While the actual area of contamination for each contaminant is not known, sensitivity analyses were performed using the RESRAD software and they showed that calculated risks are not sensitive when the area is greater than 2,000 m^2. Therefore, the area for each EA was assumed to be 2,000 m^2.

As a part of the RA, risks for all applicable exposure pathways were calculated initially based on unit concentration (1 pCi/g) over a period of 1,000 years. The results for all applicable exposure pathways were summed together to calculate risk to source ratio for all applicable pathways. The recommended model input parameters provided in Attachment A-2 of Appendix A were used during the RAs. Appendix D includes the output summary reports of RAs for all exposure scenarios. The maximum risk-to-source ratio (risk per unit concentration) over the 1,000-year evaluation period (in unit risk per pCi/g) for each COPC was then multiplied by its corresponding EPC to determine the risk associated with each COPC. The individual risks for all COPCs within each EA were then summed to determine the cumulative incremental lifetime cancer risk for each EA.

3.1.4.3 Application of Risk Characterization. During risk characterization, ELCRs were calculated for all nonradiological and radiological COPCs. In 40 CFR 300 the EPA considers remedial action at a site when cumulative ELCR to any current or future population exceeds a risk range of 10^{-4} to 10^{-6} (i.e., one case of cancer in one million to one case of cancer in ten thousand). Excess lifetime cancer risks below 10^{-6} are considered acceptable risks whereas incremental lifetime cancer risks above 10^{-4} are considered unacceptable risks. Risks between 10^{-4} to 10^{-6} are generally referred to as the "acceptable risk range." In this RA, for all CERCLA receptor scenarios, the total ELCRs for nonradiological COPCs were compared to the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. MTCA HHRA Procedures [WAC 173-340-708, subsection (5) "Multiple hazardous substances"] state that a cumulative cancer risk resulting from multiple hazardous substances should not exceed 1×10^{-5} for industrial and unrestricted use. ELCR values within or exceeding this target range require a risk management decision that

[2] The IEUBKwin model is a product of the EPA's Technical Review Workgroup for Lead, an interoffice workgroup convened by the Office of Solid Waste and Emergency Response/Office of Emergency and Remedial Response. Windows® is a registered trademark of Microsoft Corporation in the U.S. and other countries.

includes evaluating site-specific characteristics and exposure scenario factors to assess whether remedial action is warranted. For radiological COPCs, the ELCRs were compared against the EPA acceptable target risk range of 10^{-4} to 10^{-6}. Generally, remedial action under CERCLA is considered warranted when cancer risks are greater than 1×10^{-4} (OSWER Directive 9355.0-30, "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions"). Therefore, incremental lifetime cancer risks above 10^{-4} are considered unacceptable risks. Total cumulative site risk referred to risks associated with all radiological and nonradiological COPCs.

For non-cancer hazard, both the EPA and the 2013 MTCA HHRA procedures [WAC 173-340-708(5)] acceptable target HI is 1. An HI above 1 is considered unacceptable risk. The HI may exceed 1 even if all of the individual HQs are less than 1. In this case, the chemicals may be segregated by similar mechanisms of toxicity and toxicological effects. Separate HIs may then be derived based on mechanism and effect.

3.1.4.4 Identification of Risk and Hazard Contributors. In addition to risk characterization, the RA identified risk contributors from both nonradiological and radiological COPCs by utilizing the results of both carcinogenic risk and non-cancer hazard for each EA. The identification of risk and hazard contributors is presented below.

3.1.4.4.1 Nonradiological Contaminants of Potential Concern. Both carcinogenic risk and non-cancer hazard may be associated with the nonradiological COPCs. Therefore, based on the results of carcinogenic risk and non-cancer hazard, two evaluations were performed to identify major risk contributors.

Carcinogenic Risk – For CERCLA receptor scenarios, the total ELCR at each EA is compared with respect to the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. When the cumulative ELCR for nonradiological analytes exceeds 10^{-4}, those individual analytes with a risk greater than 10^{-5} are identified as major risk contributors for the EA. For MTCA receptor scenarios, the total ELCR for each EA is compared with respect to the 2013 [WAC 173-340-708(5)] MTCA cumulative risk threshold of 1×10^{-5}. When the cumulative ELCR for nonradiological analytes exceeds 10^{-5}, those individual analytes with a risk greater than 10^{-6} are identified as major risk contributors for the EA.

Non-cancer hazard – As mentioned above, the HI for each EA is compared with respect to both the EPA and the 2013 MTCA acceptable target HI of 1. When the HI exceeds 1, those individual COPCs that contribute greater than 1% of total HI are identified as major hazard contributors for the exposure area.

3.1.4.4.2 Radiological Contaminants of Potential Concern. As mentioned above, the total cumulative ELCR for each EA is compared with respect to EPA's acceptable target risk range of 10^{-4} to 10^{-6}. When the total cumulative ELCR exceeds 10^{-4}, those individual COPCs with a risk greater than 10^{-6} (those analytes that contribute greater than 1% of total cumulative ELCR) are identified as major risk contributors for the EA.

3.1.5 Results of Risk Characterization

This section summarizes the results of both nonradiological and radiological COPCs for the following receptor scenarios: (1) Industrial worker; (2) Construction worker; (3) Maintenance / Surveillance worker; (4) Adult Trespasser; (5) Youth Trespasser; (6) Residential Receptor; (7) CTUIR Resident; and (8) Yakama Nation Resident. DOE requested and invited the Native American perspectives to ensure fair consideration of differing views and to inform the agency's decision-making process. DOE respects those views and has considered them for the purposes of preparing this WMA C RA and other RAs.

3.1.5.1 Risk Characterization Results for CERCLA Industrial Worker Scenario. Table 3-3 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-1 includes the intake and risk calculations for nonradiological COPCs within each EA under industrial worker scenario. Appendix D, Attachment D-1 presents the results of maximum dose and risk assessment for over a period of 1,000 years under industrial worker scenario. Figure 3-2 presents EAs with unacceptable risk for industrial worker.

3.1.5.1.1 Carcinogenic Risk Evaluation. The total cumulative ELCRs for both nonradiological and radiological COPCs at EAs A+B, C, E, L1+L2 and P are greater than the EPA upper risk threshold of 1×10^{-4}.

For nonradiological COPCs, the total ELCRs for all EAs were within the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} and were less than the MTCA cumulative risk threshold of 1×10^{-5}. Therefore, no nonradiological risk contributors were identified.

For radiological COPCs, the total ELCRs for EAs A+B, C, E, L1+L2 and P are greater than the EPA upper risk threshold of 1×10^{-4}. The major risk contributors to the total cumulative ELCRs are ^{137}Cs and ^{126}Sn. Therefore, ^{137}Cs and ^{126}Sn are retained as radiological COPCs for further evaluation.

3.1.5.1.2 Non-Cancer Hazard Evaluation. The HIs for all EAs were less than the EPA and MTCA acceptable target HI of 1. Therefore, non-cancer hazard contributors were not identified.

3.1.5.2 Risk Characterization Results for WAC Industrial Worker Scenario under Model Toxics Control Act Method C. Table 3-4 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-2 includes the intake and risk calculations for nonradiological COPCs within each EA under the MTCA Method C industrial worker scenario.

3.1.5.2.1 Carcinogenic Risk Evaluation. For nonradiological COPCs, the total ELCRs for all EAs were less than the 2013 MTCA cumulative risk threshold of 1×10^{-5}. Therefore, no nonradiological risk contributors were retained for further evaluation.

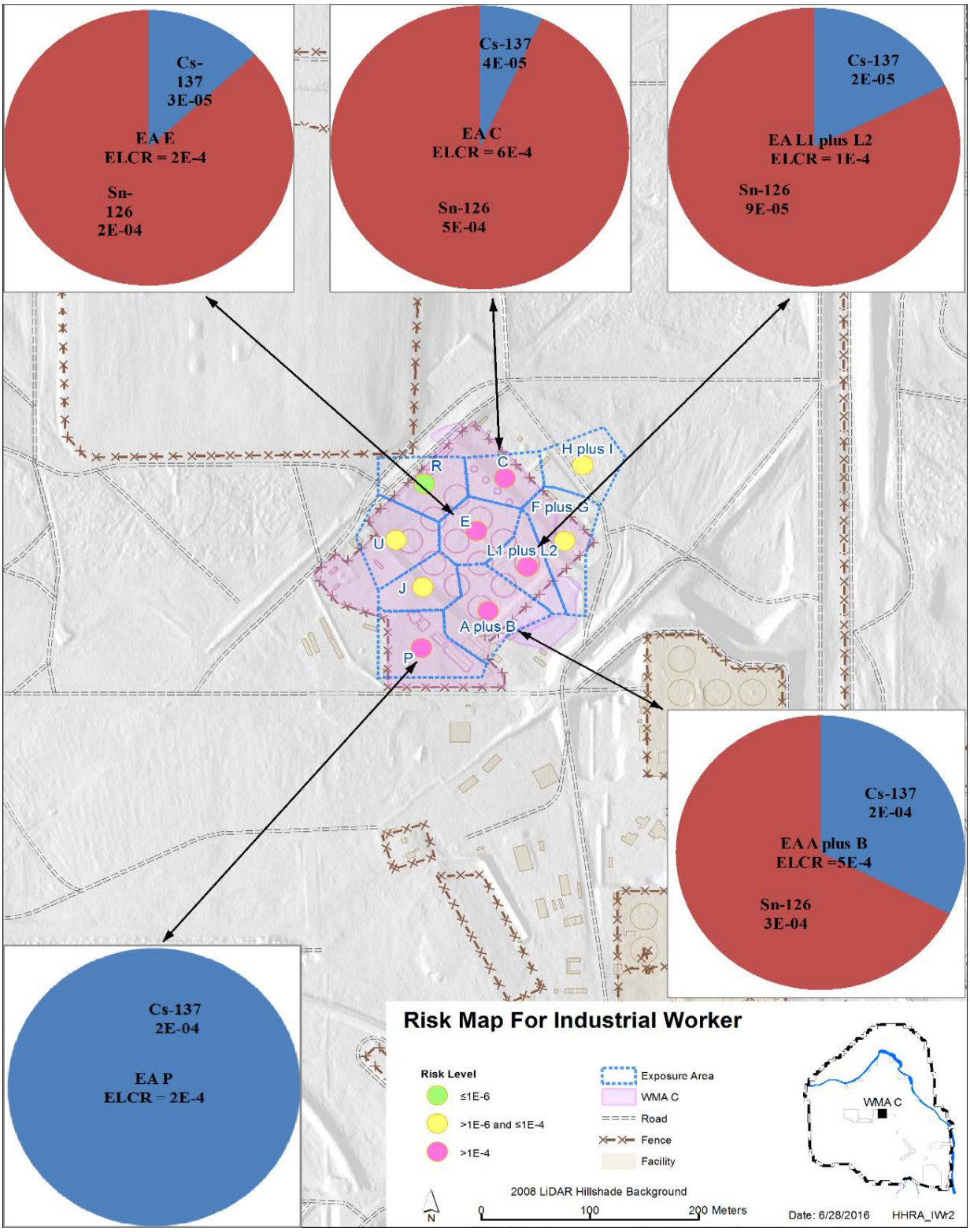
Table 3-3. Risk Characterization Results for CERCLA Industrial Worker.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	9E-07	5E-06	1E-06	8E-07	1E-06	2E-06	9E-07	1E-06	1E-06	2E-06
Inhalation	1E-09	1E-09	5E-08	9E-10	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	2E-07	1E-06	3E-07	2E-07	3E-07	4E-07	2E-07	3E-07	3E-07	4E-07
Excess Lifetime Cancer Risk	1E-06	6E-06	2E-06	1E-06	1E-06	2E-06	1E-06	1E-06	2E-06	2E-06
Major Risk Contributors	**None**									
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	5E-04	6E-04	2E-04	4E-05	8E-05	3E-05	1E-04	2E-04	7E-07	8E-05
Inhalation	9E-11	6E-13	3E-12	3E-10	1E-07	3E-10	8E-09	4E-07	4E-12	5E-11
Soil Ingestion	3E-07	1E-07	9E-08	4E-08	4E-08	6E-08	1E-07	1E-06	4E-08	8E-08
Excess Lifetime Cancer Risk	**5E-04**	**6E-04**	**2E-04**	4E-05	8E-05	3E-05	**1E-04**	**2E-04**	8E-07	8E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-126	Cs-137; Sn-126	None	None	None	Cs-137; Sn-126; Co-60; Np-237; Sr-90	Cs-137	None	None
Carcinogenic Risk – Nonradiological and Radiological Contaminants of Potential Concern										
Total Excess Lifetime Cancer Risk	**5E-04**	**6E-04**	**2E-04**	5E-05	8E-05	3E-05	**1E-04**	**2E-04**	3E-06	8E-05
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	5E-02	8E-02	4E-02	2E-02	5E-02	2E-01	4E-02	5E-02	6E-02	5E-02
Inhalation	4E-05	5E-05	8E-03	1E-05	8E-03	4E-05	9E-05	4E-05	4E-05	4E-05
Dermal Contact	1E-03	7E-03	2E-03	1E-03	2E-03	3E-03	1E-03	2E-03	2E-03	2E-03
Hazard Index	0.05	0.1	0.05	0.03	0.05	0.3	0.04	0.05	0.1	0.1
Major Hazard Contributors	None									

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*

The **bold** font indicates exceedances of acceptable excess lifetime cancer risk or hazard index limits.

Figure 3-2. Exposure Areas with Unacceptable Risks under CERCLA Industrial Worker Scenario.



CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
EA = Exposure Area ELCR = excess lifetime cancer risk WMA = Waste Management Area

Table 3-4. Risk Characterization Results for WAC Industrial Worker Based on Model Toxics Control Act Method C.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	4E-07	2E-06	6E-07	4E-07	6E-07	9E-07	4E-07	6E-07	7E-07	8E-07
Inhalation	6E-10	1E-09	6E-10	5E-10	6E-10	6E-10	5E-10	6E-10	7E-10	6E-10
Excess Lifetime Cancer Risk	4E-07	2E-06	6E-07	4.0E-07	6E-07	9E-07	4E-07	6E-07	7E-07	8E-07
Risk Contributors	None									
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	3E-02	5E-02	3E-02	3E-02	4E-02	4E-02	3E-02	3E-02	4E-02	3E-02
Inhalation	2E-04	2E-04	3E-02	2E-04	2E-04	2E-04	2E-04	2.E-04	2E-04	2.E-04
Hazard Index	0.03	0.05	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.03
Major Hazard Contributors	None									

WAC = *Washington Administrative Code*

Reference: *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act."

3.1.5.2.2 Non-Cancer Hazard Evaluation. For noncarcinogenic COPCs, the HIs for all EAs were less than the 2013 MTCA [WAC 173-340-708(5)] target HI of 1. Therefore, no non-cancer hazard contributors were identified.

3.1.5.3 Risk Characterization Results for CERCLA Construction Worker Scenario. Table 3-5 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-3 includes the intake and risk calculations for nonradiological COPCs within each EA under construction worker scenario. Appendix D, Attachment D-2 presents the results of maximum dose and risk assessment for over a period of 1,000 years under construction worker scenario.

3.1.5.3.1 Carcinogenic Risk Evaluation. The total cumulative ELCRs for both nonradiological and radiological COPCs for all EAs were less than the EPA upper risk threshold of 1×10^{-4}. For nonradiological COPCs, the total ELCRs for all EAs did not exceed the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} and the MTCA cumulative risk threshold of 1×10^{-5}. Therefore, no nonradiological risk contributors were identified.

Table 3-5. Risk Characterization Results for Construction Worker.

Exposure Pathways	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	3E-08	2E-07	4E-08	3E-08	4E-08	7E-08	3E-08	4E-08	5E-08	6E-08
Inhalation	1E-07	1E-07	2E-07	1E-07	2E-07	1E-07	1E-07	1E-07	1E-07	1E-07
Dermal Contact	3E-09	2E-08	4E-09	3E-09	4E-09	6E-09	3E-09	4E-09	4E-09	5E-09
ELCR	1E-07	3E-07	2E-07	1E-07	2E-07	2E-07	1E-07	2E-07	2E-07	2E-07
Major Risk Contributors	None									
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	8E-06	1E-05	4E-06	7E-07	2E-06	4E-07	2E-06	2E-06	6E-09	1E-06
Inhalation	5E-11	2E-11	5E-11	7E-11	8E-09	4E-11	7E-10	3E-08	7E-11	6E-11
Soil Ingestion	1E-08	9E-09	5E-09	2E-09	2E-09	2E-09	4E-09	4E-08	1E-09	3E-09
ELCR	8E-06	1E-05	4E-06	7E-07	2E-06	4E-07	2E-06	2E-06	8E-09	1E-06
Major Risk Contributors	None									
Carcinogenic Risk – Nonradiological and Radiological Contaminants of Potential Concern										
Total ELCR	8E-06	1E-05	4E-06	8E-07	2E-06	6E-07	2E-06	2E-06	2E-07	1E-06
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.04	0.07	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05
Inhalation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dermal Contact	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1
Major Hazard Contributors	None									

ELCR = excess lifetime cancer risk

For radiological COPCs, the total ELCRs for all EAs were either within the risk range of 10^{-4} to 10^{-6} or less than 1×10^{-6}. Therefore, no radiological risk contributors were identified.

3.1.5.3.2 Non-Cancer Hazard Evaluation. The HIs for all EAs were less than the EPA and MTCA acceptable target HI of 1. Therefore, no non-cancer hazard contributors were identified.

3.1.5.4 Risk Characterization Results for CERCLA Maintenance/Surveillance Worker Scenario. Table 3-6 provides a summary of the cancer risks and non-cancer hazards by

exposure route for each EA. Appendix C, Attachment C-4 includes the intake and risk calculations for nonradiological COPCs within each EA under maintenance/surveillance worker scenario. Appendix D, Attachment D-3 presents the results of maximum dose and risk assessment for over a period of 1,000 years under maintenance/surveillance worker scenario. Figure 3-3 shows EAs with unacceptable risk for maintenance/surveillance worker.

3.1.5.4.1 Carcinogenic Risk Evaluation. The total cumulative ELCRs for both nonradiological and radiological COPCs at five EAs (A+B, C, E, L1+L2 and P) are greater than the EPA upper risk threshold of 1×10^{-4}.

For nonradiological COPCs, the total ELCRs for all EAs were less than the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} and were also less than the MTCA cumulative risk threshold of 1×10^{-5}. Therefore, no nonradiological risk contributors were identified.

For radiological COPCs, the total ELCRs for five EAs (A+B, C, E, L1+L2 and P) are greater than the EPA upper risk threshold of 1×10^{-4}. The major risk contributors are ^{137}Cs and ^{126}Sn. Therefore, they are retained as radiological COPCs for further evaluation.

3.1.5.4.2 Non-Cancer Hazard Evaluation. The HIs for all EAs were less than the EPA and MTCA acceptable target HI of 1. Therefore, non-cancer hazard contributors were not identified.

3.1.5.5 Risk Characterization Results for CERCLA Trespasser Adult Scenario. Table 3-7 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-5 includes the intake and risk calculations for nonradiological COPCs within each EA under trespasser adult receptor scenario. Appendix D, Attachment D-4 presents the results of maximum dose and risk assessment for over a period of 1,000 years under trespasser adult receptor scenario.

3.1.5.5.1 Carcinogenic Risk Evaluation. The total cumulative ELCRs for both nonradiological and radiological COPCs for all EAs were less than the EPA upper risk threshold of 1×10^{-4}. For nonradiological COPCs, the total ELCRs for all EAs were less than the EPA's acceptable lower risk limit of 1×10^{-6} and were also less than the MTCA cumulative risk threshold of 1×10^{-5}. Therefore, no major nonradiological risk contributor was identified.

For radiological COPCs, the total ELCRs for all EAs were either within the EPA acceptable risk range of 10^{-4} to 10^{-6} or less than 1×10^{-6}. Therefore, no major radiological risk contributor was identified.

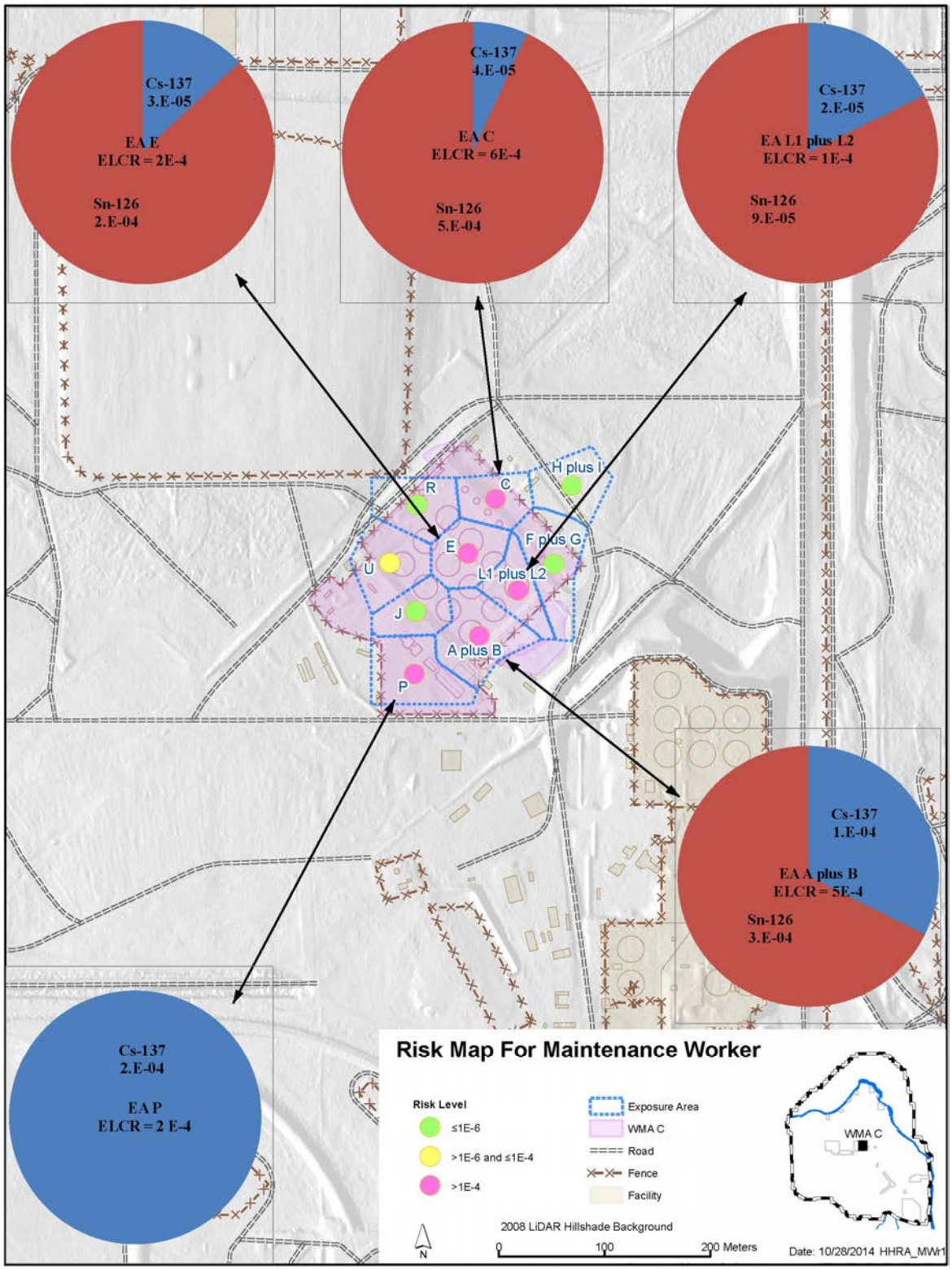
3.1.5.6 Non-Cancer Hazard Evaluation. The HIs for all EAs were less than the EPA and MTCA acceptable target HI of 1. Therefore, no major non-cancer hazard contributor was identified.

Table 3-6. Risk Characterization Results for Maintenance/Surveillance Worker.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1E-06	6E-06	1E-06	1E-06	1E-06	2E-06	9E-07	1E-06	2E-06	2E-06
Inhalation	5E-10	8E-10	9E-10	5E-10	9E-10	7E-10	6E-10	7E-10	7E-10	6E-10
Dermal Contact	1E-07	6E-07	1E-07	1E-07	1E-07	2E-07	1E-07	2E-07	2E-07	2E-07
Excess Lifetime Cancer Risk	1E-06	7E-06	2E-06	1E-06	2E-06	2E-06	1E-06	2E-06	2E-06	2E-06
Major Risk Contributors	None									
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	5E-04	6.E-04	2.E-04	4.E-05	8.E-05	3.E-05	1.E-04	2.E-04	7.E-07	7.E-05
Inhalation	5E-11	6.E-13	3.E-12	2.E-10	6.E-08	2.E-10	4.E-09	2.E-07	4.E-12	3.E-11
Soil Ingestion	3E-07	1.E-07	1.E-07	4.E-08	4.E-08	6.E-08	1.E-07	1.E-06	4.E-08	9.E-08
Excess Lifetime Cancer Risk	**5E-04**	**6.E-04**	**2.E-04**	4.E-05	8.E-05	3.E-05	**1.E-04**	**2.E-04**	8.E-07	7.E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-126	Cs-137; Sn-126	None	None	None	Cs-137; Sn-126	Cs-137	None	None
Carcinogenic Risk – Nonradiological and Radiological Contaminants of Potential Concern										
Total Excess Lifetime Cancer Risk	**5E-04**	**6E-04**	**2E-04**	4E-05	8E-05	3E-05	**1E-04**	**2E-04**	2E-06	8E-05
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.06	0.10	0.06	0.06	0.07	0.07	0.05	0.06	0.07	0.06
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.06	0.1	0.07	0.06	0.07	0.1	0.05	0.07	0.1	0.1
Major Hazard Contributors	None									

The **bold** font indicates exceedances of acceptable excess lifetime cancer risk or hazard index limits.

Figure 3-3. Exposure Areas with Unacceptable Risks under CERCLA Maintenance/Surveillance Worker Scenario.



CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
EA = Exposure Area ELCR = excess lifetime cancer risk WMA = Waste Management Area

Table 3-7. Risk Characterization Results for CERCLA Trespasser Adult Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1E-07	7E-07	2E-07	1E-07	2E-07	3E-07	1E-07	2E-07	2E-07	2E-07
Inhalation	6E-11	9E-11	1E-10	6E-11	1E-10	7E-11	6E-11	8E-11	7E-11	7E-11
Dermal Contact	1E-08	8E-08	2E-08	1E-08	2E-08	3E-08	1E-08	2E-08	2E-08	3E-08
ELCR	1E-07	8E-07	2E-07	1E-07	2E-07	3E-07	1E-07	2E-07	2E-07	3E-07
Major Risk Contributors	None									
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	5E-05	7E-05	2E-05	5E-06	9E-06	4E-06	1E-05	2E-05	1E-08	9E-06
Inhalation	6E-12	7E-14	3E-13	2E-11	7E-09	2E-11	5E-10	3E-08	2E-10	3E-12
Soil Ingestion	4E-08	2E-08	1E-08	5E-09	5E-09	7E-09	1E-08	1E-07	4E-09	1E-08
ELCR	5E-05	7E-05	2E-05	5E-06	9E-06	4E-06	1E-05	2E-05	2E-08	9E-06
Major Risk Contributors	None									
Carcinogenic Risk – Nonradiological and Radiological Contaminants of Potential Concern										
Total ELCR	5E-05	7E-05	3E-05	5E-06	9E-06	4E-06	1E-05	2E-05	2E-07	9E-06
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Major Hazard Contributors	None									

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

3.1.5.7 Risk Characterization Results for CERCLA Trespasser Youth Receptor Scenario.

Table 3-8 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-6 includes the intake and risk calculations for nonradiological COPCs within each EA under trespasser youth receptor scenario. Attachment D-5 presents the results of maximum dose and risk assessment for over a period of 1,000 years under trespasser youth receptor scenario.

Table 3-8. Risk Characterization Results for CERCLA Trespasser Youth Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	2E-07	1E-06	3E-07	2E-07	3E-07	5E-07	2E-07	3E-07	3E-07	4E-07
Inhalation	8E-11	1E-10	1E-10	8E-11	1E-10	1E-10	8E-11	1E-10	1E-10	9E-11
Dermal Contact	4E-08	2E-07	5E-08	4E-08	5E-08	8E-08	4E-08	5E-08	6E-08	7E-08
ELCR	3E-07	1E-06	4E-07	3E-07	3E-07	5E-07	3E-07	4E-07	4E-07	5E-07
Major Risk Contributors	None									
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	1E-04	2E-04	6E-05	1E-05	2E-05	6E-06	3E-05	4E-05	1E-07	2E-05
Inhalation	3E-11	1E-13	4E-13	9E-11	3E-08	1E-10	2E-09	1E-07	5E-13	1E-11
Soil Ingestion	6E-08	4E-08	2E-08	7E-09	8E-09	1E-08	2E-08	2E-07	6E-09	2E-08
ELCR	**1E-04**	**2E-04**	6E-05	1E-05	2E-05	6E-06	3E-05	4E-05	1E-07	2E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-127	None							
Carcinogenic Risk – Nonradiological and Radiological Contaminants of Potential Concern										
Total ELCR	**1E-04**	**2E-04**	6E-05	1E-05	2E-05	6E-06	3E-05	4E-05	5E-07	2E-05
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.04	0.08	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.04	0.08	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05
Major Hazard Contributors	None									

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

3.1.5.7.1 Carcinogenic Risk Evaluation. The total cumulative ELCRs for both nonradiological and radiological COPCs at two EAs (A+B, and C) are greater than the EPA upper risk threshold of 1×10^{-4}. For nonradiological COPCs, the total ELCR for all EAs were less than or equal to the EPA's acceptable lower risk limit of 1×10^{-6}. Therefore, no major nonradiological risk contributor was identified.

For radiological COPCs, the total ELCRs for two EAs (A+B and C) are greater than the EPA upper risk threshold of 1×10^{-4}. The major risk contributors are ^{137}Cs and ^{126}Sn. Therefore, ^{137}Cs and ^{126}Sn are retained as radiological COPCs for further evaluation.

3.1.5.7.2 Non-Cancer Hazard Evaluation. The HIs for all EAs were less than the EPA and MTCA acceptable target HI of 1. Therefore, no major non-cancer hazard contributor was identified.

Figure 3-4 shows EAs with unacceptable risk for trespasser youth receptor.

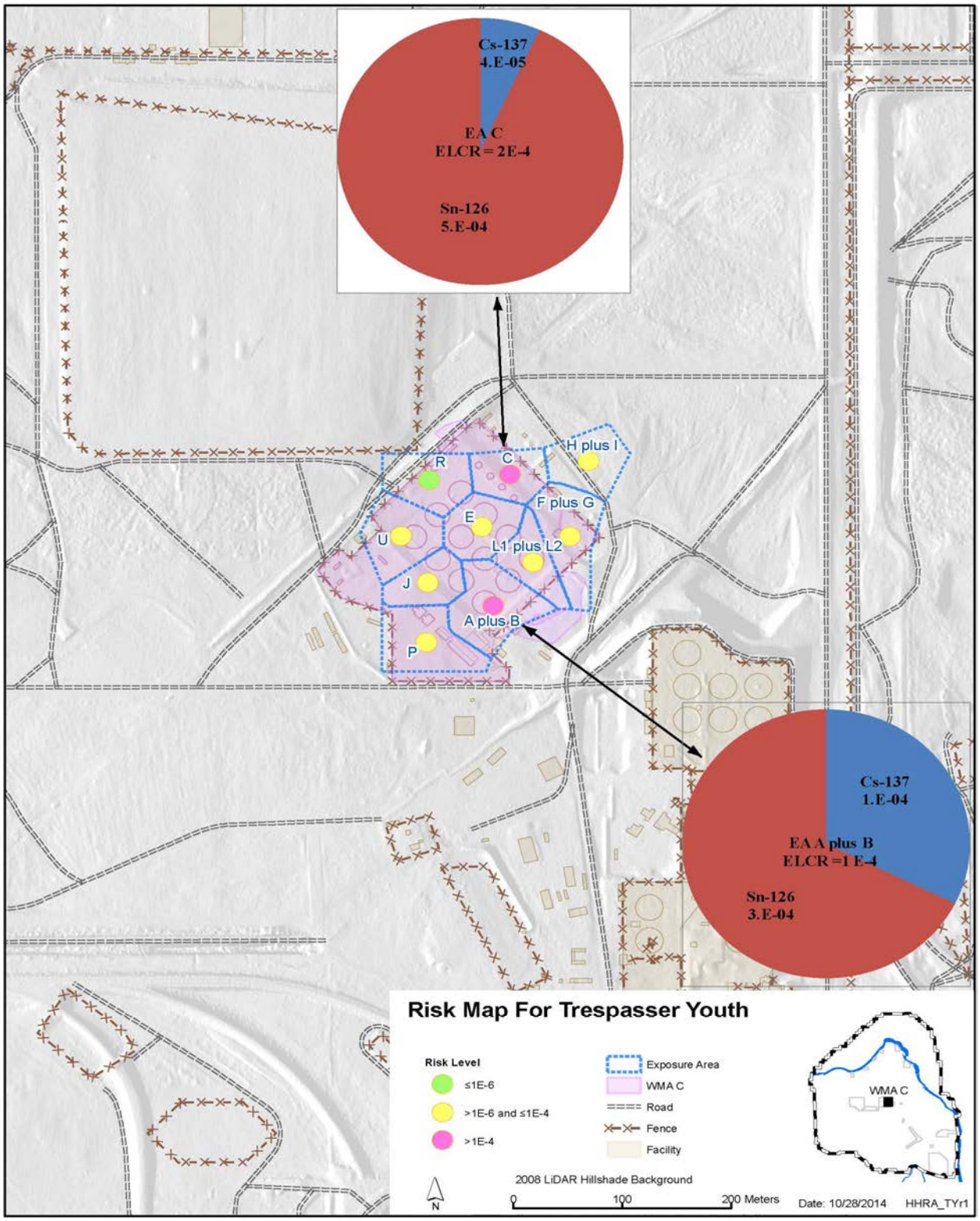
3.1.5.8 Risk Characterization Results for CERCLA Residential Receptor. Tables 3-9 and 3-10 provide a summary of the cancer risks and non-cancer hazard by exposure route for each EA, respectively. Appendix C, Attachment C-7 and Attachment C-8 include the intake and risk calculations for all 10 EAs under residential adult and residential child receptor scenario, respectively.

Non-cancer hazards for residential child scenario are typically higher as compared to that for residential adult. Therefore, for risk characterization involving nonradiological COPCs, separate risk characterizations were performed for residential adult and residential child. For radiological COPCs, age-weighted intake parameters for residential receptor result in higher risks as compared to that for residential adult and residential child. Therefore, residential receptor with age-weighted intake parameters was utilized during radiological risk characterization. Appendix D, Attachment D-6 presents the results of maximum radiological dose and risk assessments over a period of 1,000 years under residential receptor scenario. Figure 3-5 shows EAs with unacceptable risk for residential receptor.

3.1.5.8.1 Carcinogenic Risk Evaluation. For nonradiological COPCs, the total ELCRs for both residential adult and residential youth were within than the EPA's acceptable risk range 1×10^{-4} to 1×10^{-6} and were less than the MTCA cumulative risk threshold of 10^{-5}. Therefore, no nonradiological COPCs were retained.

For radiological COPCs, except of EA R, the total ELCRs for all EAs are greater than the EPA risk threshold of 1×10^{-4}. Cesium-137, ^{60}Co, ^{63}Ni, ^{79}Se, ^{90}Sr, ^{126}Sn and ^{99}Tc were identified as major risk contributors at various EAs. Therefore, they are retained as radiological COPCs for further evaluation.

Figure 3-4. Exposure Areas with Unacceptable Risks under CERCLA Trespasser Youth Receptor Scenario.



CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
EA = Exposure Area ELCR = excess lifetime cancer risk WMA = Waste Management Area

Table 3-9. Carcinogenic Risk Results for CERCLA Residential Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk for Residential Adult - Nonradiological Contaminants of Potential Concern										
Soil Ingestion	2E-06	5E-09	3E-06	2E-06	3E-06	4E-06	2E-06	3E-06	3E-06	4E-06
Inhalation	3E-09	5E-09	6E-09	3E-09	6E-09	4E-09	3E-09	4E-09	4E-09	4E-09
Dermal Contact	2E-07	1E-06	3E-07	3E-07	3E-07	5E-07	2E-07	4E-07	4E-07	5E-07
ELCR	2E-06	1E-05	3E-06	2E-06	3E-06	5E-06	2E-06	3E-06	3E-06	4E-06
Major Risk Contributors	None									
Carcinogenic Risk for Residential Child - Nonradiological Contaminants of Potential Concern										
Soil Ingestion	6E-06	3E-05	9E-06	6E-06	8E-06	1E-05	6E-06	8E-06	1E-05	1E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	7E-07	5E-07	7E-07	1E-06	5E-07	7E-07	8E-07	9E-07
ELCR	7E-06	4E-05	9E-06	6E-06	9E-06	1E-05	6E-06	9E-06	1E-05	1E-05
Major Risk Contributors	None									
Carcinogenic Risk - Radiological Contaminants of Potential Concern										
External Gamma	1E-03	2E-03	6E-04	1E-04	2E-04	9E-05	3E-04	6E-04	4E-07	2E-04
Inhalation	4E-08	1E-08	6E-08	4E-08	4E-07	1E-08	7E-08	2E-06	7E-08	7E-08
Fruits, Grains & Vegetables Ingestion	7E-04	8E-04	3E-04	5E-05	1E-04	1E-04	2E-04	1E-03	5E-06	2E-04
Meat Ingestion	4E-04	5E-04	2E-04	8E-05	1E-04	3E-04	1E-04	2E-04	5E-07	1E-04
Milk	1E-04	1E-04	7E-05	2E-05	3E-05	7E-05	4E-05	1E-04	3E-07	3E-05
Soil Ingestion	2E-06	1E-06	7E-07	3E-07	3E-07	4E-07	8E-07	8E-06	3E-07	7E-07
ELCR	**2E-03**	**2E-03**	**1E-03**	**2E-04**	**4E-04**	**3E-04**	**5E-04**	**2E-03**	7E-06	**4E-04**
Major Risk Contributors	Cs-137, Se-79, Sn-126, Sr-90	Cs-137, Sn-126, Sr-90	Cs-137, Se-79, Sn-126, Sr-90	Cs-137, Se-79, Sn-126, Sr-90	H-3, Se-79, Sn-126	C-14, Cs-137, Se-79, Sr-90	C-14, Cs-137, Ni-63, Se-79, Sn-126, Sr-90	Co-60, Cs-137, Se-79, Sr-90, Tc-99	None	Cs-137, Se-79, Sn-126, Sr-90

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* ELCR = excess lifetime cancer risk

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

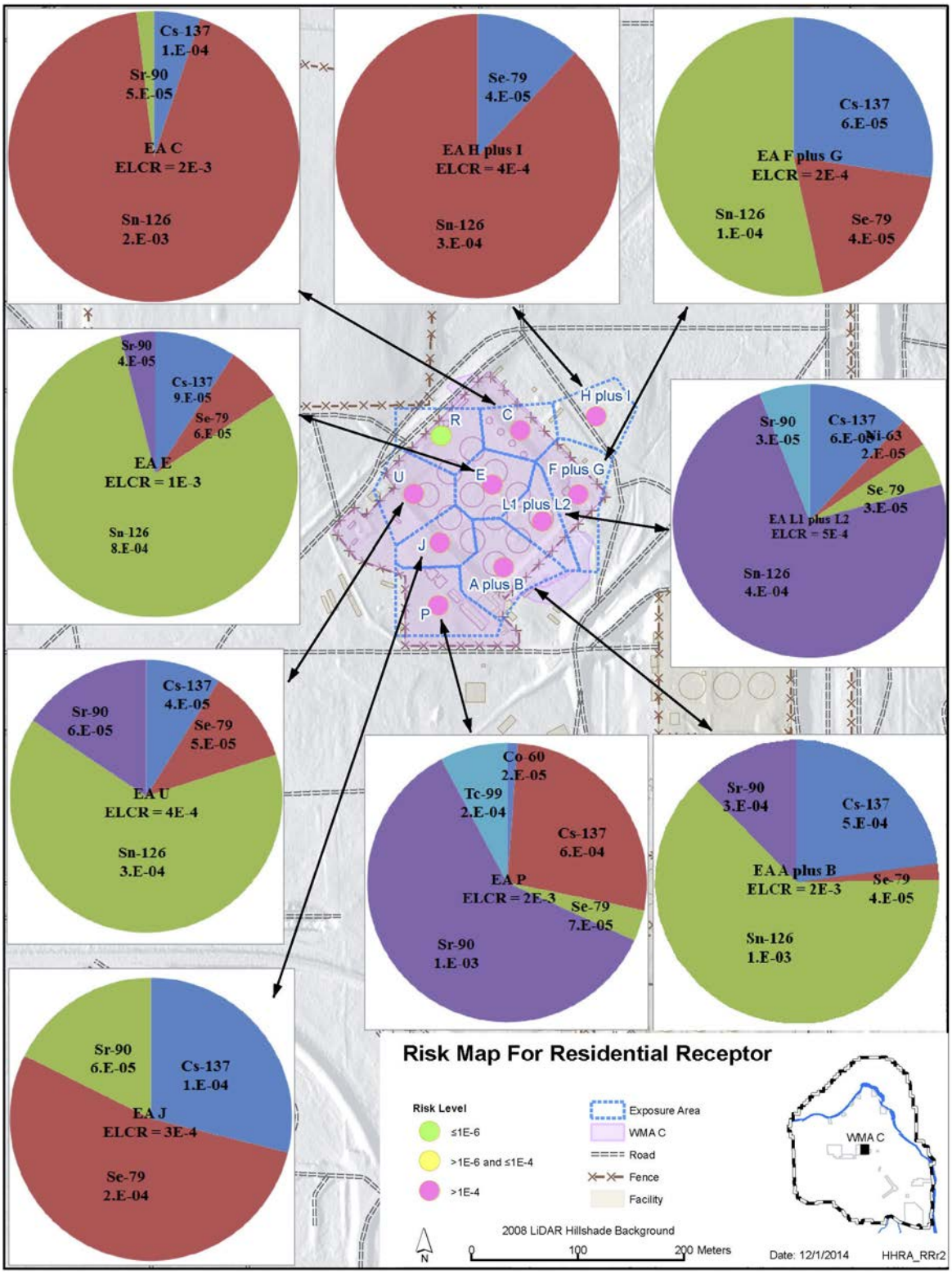
Table 3-10. Non-Cancer Hazard Results for CERCLA Residential Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Non-Cancer Hazard for Residential Adult – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1
Major Hazard Contributors	None									
Non-Cancer Hazard For Residential Child – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1.4	2.4	1.5	1.4	1.6	1.6	1.3	1.5	1.7	1.5
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	0.01	0.07	0.02	0.01	0.02	0.03	0.01	0.02	0.02	0.02
Hazard Index	**1.4**	**2.5**	**1.6**	**1.4**	**1.6**	**1.6**	**1.3**	**1.6**	**1.7**	**1.5**
Major Hazard Contributors	**Common for All Exposure Areas** Aluminum, Arsenic, Chromium, Cobalt, Iron, Lithium, Manganese, and Vanadium **Specific to Exposure Area J** Antimony **Specific to Exposure Area C and Exposure Area U** Cadmium									

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*

The **bold** font indicates exceedances of acceptable excess lifetime cancer risk or hazard index limits.

Figure 3-5. Exposure Areas with Unacceptable Risks under CERCLA Residential Receptor Scenario.



CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
EA = Exposure Area ELCR = excess lifetime cancer risk WMA = Waste Management Area

3.1.5.8.2 Non-Cancer Hazard Evaluation. The HIs for residential adult receptor were less than the CERCLA and MTCA acceptable target HI of 1. However, for residential child, all EAs report an HI greater than the CERCLA acceptable target HI of 1. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, iron, lithium, manganese, and vanadium were identified as hazard contributors. Therefore, an evaluation was performed for each EA to segregate the HIs associated with those hazard contributors by similar mechanisms of action (critical effect) and toxicological effects. When the HI based on similar mechanism of action is greater than 1, those hazard contributors will be retained. The mechanisms of action (critical effect) for each of the hazard contributors are as follows:

- Aluminum – neurological effects
- Antimony – longevity, blood glucose, and cholesterol
- Arsenic – hyperpigmentation, keratosis, and possible vascular complications
- Cadmium – significant proteinuria
- Chromium – nasal septum atrophy
- Cobalt – blood effects
- Iron – gastrointestinal tract effects
- Lithium – nervous system and kidney effects
- Manganese – central nervous system effects
- Vanadium – decreased hair cysteine.

The results of the evaluations for each EA are summarized in more detail in the following section.

EA A+B – The HI for EA A+B is 1.4, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.097; 6.8% contribution), arsenic (HQ = 0.17; 12% contribution), chromium (HQ = 0.041; 2.9% contribution), cobalt (HQ = 0.39; 27% contribution), iron (HQ = 0.44; 31% contribution), lithium (HQ = 0.053; 3.8% contribution), manganese (HQ = 0.032; 2.3% contribution), and vanadium (HQ = 0.15; 11% contribution).

Among all hazard contributors for EA A+B, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.18, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA A+B.

EA C – The HI for EA C is 2.5, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.12; 4.8% contribution), arsenic (HQ = 0.98; 39% contribution), chromium (HQ = 0.055; 2.2% contribution), cobalt (HQ = 0.47; 19% contribution), iron (HQ = 0.52; 21% contribution), lithium (HQ = 0.077; 3.1% contribution), manganese (HQ = 0.041; 1.6% contribution), and vanadium (HQ = 0.20; 8.0% contribution).

Among all hazard contributors for EA C, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.24, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA C.

EA E – The HI for EA E is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.095; 6.1% contribution), arsenic (HQ = 0.24; 15% contribution), cadmium (HQ = 0.046; 3.0% contribution), chromium (HQ = 0.073; 4.7% contribution), cobalt (HQ = 0.38; 24% contribution), iron (HQ = 0.44; 28% contribution), lithium (HQ = 0.058; 3.7% contribution), manganese (HQ = 0.045; 2.9% contribution), and vanadium (HQ = 0.15; 9.6% contribution).

Among all hazard contributors for EA E, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.2, which is less than the target HI of 1. In addition, exposure to cadmium and lithium result in kidney effects; summing the HQs for these two analytes results in an HQ of 0.10, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA E.

EA F+G – The HI for EA F+G is 1.4, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.086; 6.3% contribution), arsenic (HQ = 0.16; 12% contribution), chromium (HQ = 0.038; 2.8% contribution), cobalt (HQ = 0.35; 25% contribution), iron (HQ = 0.44; 32% contribution), lithium (HQ = 0.047; 3.5% contribution), manganese (HQ = 0.035; 2.6% contribution), and vanadium (HQ = 0.18; 13% contribution).

Among all hazard contributors for EA F+G, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.17, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA F+G.

EA H+I – The HI for EA H+I is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.090; 5.6% contribution), arsenic (HQ = 0.23; 14% contribution), chromium (HQ = 0.072; 4.5% contribution), cobalt (HQ = 0.43; 27% contribution), iron (HQ = 0.48; 30% contribution), lithium (HQ = 0.048; 3.0% contribution), manganese (HQ = 0.037; 2.3% contribution), and vanadium (HQ = 0.17; 11% contribution).

Among all hazard contributors for EA H+I, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.18, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA H+I.

EA J – The HI for EA J is 1.7, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.099; 6.0% contribution), antimony (HQ = 0.069; 4.2% contribution), arsenic (HQ = 0.36; 22% contribution), chromium (HQ = 0.049; 3.0% contribution), cobalt (HQ = 0.35; 21% contribution), iron (HQ = 0.44; 27% contribution), lithium (HQ = 0.055; 3.4% contribution), manganese (HQ = 0.035; 2.1% contribution), and vanadium (HQ = 0.14; 8.4% contribution).

Among all hazard contributors for EA J, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.19, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA J.

EA L1+L2 – The HI for EA L1+L2 is 1.3, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.082; 6.3% contribution), arsenic (HQ = 0.17; 13% contribution), chromium (HQ = 0.041; 3.2% contribution), cobalt (HQ = 0.35; 27% contribution), iron (HQ = 0.38; 30% contribution), lithium (HQ = 0.045; 3.5% contribution), manganese (HQ = 0.033; 2.5% contribution), and vanadium (HQ = 0.15; 12% contribution).

Among all hazard contributors for EA L1+L2, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.16, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA L1+L2.

EA P – The HI for EA P is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.091; 5.8% contribution), arsenic (HQ = 0.23; 15% contribution), chromium (HQ = 0.053; 3.4% contribution), cobalt (HQ = 0.39; 25% contribution), iron (HQ = 0.46; 30% contribution), lithium (HQ = 0.053; 3.4% contribution), manganese (HQ = 0.033; 2.1% contribution), and vanadium (HQ = 0.20; 13% contribution).

Among all hazard contributors for EA P, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.18, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA P.

EA R – The HI for EA R is 1.7, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.11; 6.4% contribution), arsenic (HQ = 0.27; 16% contribution), cadmium (HQ = 0.049; 2.9% contribution), chromium (HQ = 0.048; 2.8% contribution), cobalt (HQ = 0.45; 27% contribution), iron (HQ = 0.47; 28% contribution), lithium (HQ = 0.058; 3.4% contribution), manganese (HQ = 0.037; 2.2% contribution), and vanadium (HQ = 0.16; 9.7% contribution).

Among all hazard contributors for EA E, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.2, which is less than the target HI of 1. In addition, exposure to cadmium and lithium result in kidney effects; summing the HQs for these two analytes results in an HQ of 0.11, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA R.

EA U – The HI for EA U is 1.5, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.11; 6.9% contribution), arsenic (HQ = 0.32; 21% contribution), chromium (HQ = 0.043; 2.8% contribution), cobalt (HQ = 0.37; 25% contribution), iron (HQ = 0.42; 28% contribution), lithium (HQ = 0.059; 3.9% contribution), manganese (HQ = 0.033; 2.2% contribution), and vanadium (HQ = 0.13; 8.7% contribution).

Even though their combined HI is greater than 1, the HQ for each hazard contributor is less than 1. Therefore, no hazard contributors were retained for EA U.

3.1.5.9 Risk Characterization Results for WAC Residential Scenario Based on Model Toxics Control Act Method B Standard. Table 3-11 provides a summary of the cancer risks and non-cancer hazards by exposure route for each EA. Appendix C, Attachment C-9 includes the intake and risk calculations for all 10 EAs under residential scenario, developed based on MTCA Method B standard.

3.1.5.9.1 Carcinogenic Risk Evaluation. For nonradiological COPCs, the cumulative ELCR at EA C is greater than the 2013 MTCA cumulative risk threshold of 1×10^{-5}. EA C reports a cumulative ELCR of 3×10^{-5}; the primary contributor to risk is arsenic (3×10^{-5}; 100% contribution).

Table 3-11. Risk Characterization Results for WAC Residential Scenario Based on Model Toxics Control Act Method B Standard.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	6E-06	3E-05	8E-06	5E-06	8E-06	1E-05	5E-06	8E-06	9E-06	1E-05
Inhalation	6E-10	1E-09	6E-10	5E-10	6E-10	6E-10	5E-10	6E-10	7E-10	6E-10
ELCR	6E-06	3E-05	8E-06	5E-06	8E-06	1E-05	5E-06	8E-06	9E-06	1E-05
Major Risk Contributors	None	Arsenic	None							
Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1.4	2.4	1.5	1.3	1.6	1.6	1.3	1.5	1.6	1.5
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	**1.4**	**2.4**	**1.5**	**1.3**	**1.6**	**1.6**	**1.3**	**1.5**	**1.6**	**1.5**
Major Hazard Contributors	**Common for All Exposure Areas** Aluminum, Arsenic, Chromium, Cobalt, Iron, Lithium, Manganese, and Vanadium **Specific to Exposure Area J** Antimony **Specific to Exposure Area E and Exposure Area R** Cadmium									

ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

3.1.5.9.2 Non-Cancer Hazard Evaluation. For noncarcinogenic COPCs, all EAs report an HI greater than the EPA and MTCA acceptable target HI of 1. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, iron, lithium, manganese, and vanadium were identified as hazard contributors. Therefore, an evaluation was performed for each EA to segregate the HIs associated with those hazard contributors by similar mechanisms of action (critical effect). When the HI based on similar mechanism of action is greater than 1, those hazard contributors will be retained. The mechanisms of action (critical effect) for each of the hazard contributors are as follows:

- Aluminum – neurological effects
- Antimony – longevity, blood glucose, and cholesterol
- Arsenic – hyperpigmentation, keratosis, and possible vascular complications
- Cadmium – significant proteinuria
- Chromium – nasal septum atrophy
- Cobalt – blood effects
- Iron – gastrointestinal tract effects
- Lithium – nervous system and kidney effects
- Manganese – central nervous system effects
- Vanadium – decreased hair cysteine.

The results of the evaluations for each EA are summarized in more detail in the following sections.

EA A+B – The HI for EA A+B is 1.4, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.094; 7% contribution), arsenic (HQ = 0.16; 11% contribution), chromium (HQ = 0.04; 3% contribution), cobalt (HQ = 0.38; 28% contribution), iron (HQ = 0.43; 31% contribution), lithium (HQ = 0.05; 4% contribution), manganese (HQ = 0.03; 2% contribution), and vanadium (HQ = 0.15; 11% contribution).

Among all hazard contributors for EA A+B, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.18, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA A+B.

EA C – The HI for EA C is 2.4, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.12; 5% contribution), arsenic (HQ = 0.88; 37% contribution), chromium (HQ = 0.053; 2% contribution), cobalt (HQ = 0.46; 19% contribution), iron (HQ = 0.51; 21% contribution), lithium (HQ = 0.076; 3% contribution), manganese (HQ = 0.04; 2% contribution), and vanadium (HQ = 0.2; 8.0% contribution).

Among all hazard contributors for EA C, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.23, which is less than the target HI of 1. Other hazard contributors for this EA result in a different

critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA C.

EA E – The HI for EA E is 1.5, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.093; 6% contribution), arsenic (HQ = 0.22; 14% contribution), cadmium (HQ = 0.041; 3% contribution), chromium (HQ = 0.072; 5% contribution), cobalt (HQ = 0.37; 24% contribution), iron (HQ = 0.43; 29% contribution), lithium (HQ = 0.057; 4% contribution), manganese (HQ = 0.044; 3% contribution), and vanadium (HQ = 0.15; 10% contribution).

Among all hazard contributors for EA E, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.19, which is less than the target HI of 1. In addition, exposure to cadmium and lithium result in kidney effects; summing the HQs for these two analytes results in an HQ of 0.10, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA E.

EA F+G – The HI for EA F+G is 1.3, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.085; 6% contribution), arsenic (HQ = 0.15; 11% contribution), chromium (HQ = 0.037; 3% contribution), cobalt (HQ = 0.34; 26% contribution), iron (HQ = 0.43; 32% contribution), lithium (HQ = 0.046; 3% contribution), manganese (HQ = 0.035; 3% contribution), and vanadium (HQ = 0.17; 13% contribution).

Among all hazard contributors for EA F+G, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.17, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA F+G.

EA H+I – The HI for EA H+I is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.088; 6% contribution), arsenic (HQ = 0.21; 14% contribution), chromium (HQ = 0.07; 5% contribution), cobalt (HQ = 0.42; 27% contribution), iron (HQ = 0.47; 30% contribution), lithium (HQ = 0.047; 3.0% contribution), manganese (HQ = 0.037; 2% contribution), and vanadium (HQ = 0.17; 11% contribution).

Among all hazard contributors for EA H+I, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.17, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA H+I.

EA J – The HI for EA J is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.097; 6.0% contribution), antimony (HQ = 0.068; 4% contribution), arsenic (HQ = 0.33; 21% contribution), chromium (HQ = 0.048; 3.0% contribution), cobalt (HQ = 0.34; 22% contribution), iron (HQ = 0.43; 27% contribution), lithium (HQ = 0.054; 3% contribution), manganese (HQ = 0.034; 2% contribution), and vanadium (HQ = 0.14; 9% contribution).

Among all hazard contributors for EA J, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.19, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA J.

EA L1+L2 – The HI for EA L1+L2 is 1.3, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.08; 6% contribution), arsenic (HQ = 0.15; 12% contribution), chromium (HQ = 0.04; 3% contribution), cobalt (HQ = 0.34; 27% contribution), iron (HQ = 0.38; 30% contribution), lithium (HQ = 0.044; 4% contribution), manganese (HQ = 0.032; 3% contribution), and vanadium (HQ = 0.15; 12% contribution).

Among all hazard contributors for EA L1+L2, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.16, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA L1+L2.

EA P – The HI for EA P is 1.5, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.089; 6% contribution), arsenic (HQ = 0.21; 14% contribution), chromium (HQ = 0.052; 3% contribution), cobalt (HQ = 0.38; 25% contribution), iron (HQ = 0.45; 30% contribution), lithium (HQ = 0.052; 3% contribution), manganese (HQ = 0.033; 2% contribution), and vanadium (HQ = 0.19; 13% contribution).

Among all hazard contributors for EA P, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.17, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA P.

EA R – The HI for EA R is 1.6, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.10; 6% contribution), arsenic (HQ = 0.24; 15% contribution), cadmium (HQ = 0.043; 3% contribution), chromium (HQ = 0.047; 3% contribution), cobalt (HQ = 0.44; 27% contribution), iron (HQ = 0.46; 28% contribution),

lithium (HQ = 0.057; 3% contribution), manganese (HQ = 0.037; 2% contribution), and vanadium (HQ = 0.16; 10% contribution).

Among all hazard contributors for EA R, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes result in an HQ of 0.2, which is less than the target HI of 1. In addition, exposure to cadmium and lithium result in kidney effects; summing the HQs for these two analytes results in an HQ of 0.08, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA R.

EA U – The HI for EA U is 1.5, which is greater than the EPA and MTCA acceptable target HI of 1. The primary contributors to non-cancer HI (those analytes that contribute greater than 1% of the total HI) are aluminum (HQ = 0.10; 7% contribution), arsenic (HQ = 0.29; 20% contribution), chromium (HQ = 0.042; 3% contribution), cobalt (HQ = 0.36; 25% contribution), iron (HQ = 0.41; 28% contribution), lithium (HQ = 0.058; 4% contribution), manganese (HQ = 0.033; 2% contribution), and vanadium (HQ = 0.13; 9% contribution).

Among all hazard contributors for EA U, exposure to aluminum, lithium, and manganese result in neurological effects; summing the HQs for these three analytes results in an HQ of 0.19, which is less than the target HI of 1. Other hazard contributors for this EA result in a different critical effect; as such, it is appropriate to segregate the contributions of each hazard contributor. Therefore, no hazard contributors were retained for EA U.

3.1.5.10 Risk Characterization Results for Confederated Tribes of the Umatilla Indian Reservation Resident Receptor. DOE performed RAs for the CTUIR and Yakama Nation receptor scenarios to assist interested parties in providing input to risk managers. The report will be available in the Hanford Administrative Record/Public Information Repository so that the interested parties will have an opportunity to review and provide comments related to the report.

Table 3-12 provides a summary of the cancer risks and non-cancer hazard by exposure route for each EA, respectively. Like the residential receptor, risk characterization of nonradiological COPCs was performed for adult and child, separately. Age-weighted intake parameters were utilized during radiological risk characterization. Appendix C, Attachment C-10 and Attachment C-11 include the intake and risk calculations for all 10 EAs under CTUIR resident adult and CTUIR resident child receptor scenario, respectively. Appendix D, Attachment D-7 presents the results of maximum radiological dose and risk assessments over a period of 1,000 years under CTUIR residential receptor scenario. The risk characterization was performed for information purposes.

Table 3-12. Risk Characterization Results for Confederated Tribes of the Umatilla Indian Reservation Resident Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Adult Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	3E-05	2E-04	4E-05	3E-05	4E-05	6E-05	3E-05	4E-05	5E-05	5E-05
Inhalation	1E-08	2E-08	2E-08	1E-08	2E-08	1E-08	1E-08	1E-08	1E-08	1E-08
Dermal Contact	9E-07	5E-06	1E-06	9E-07	1E-06	2E-06	9E-07	1E-06	1E-06	2E-06
ELCR	**3E-05**	**2E-04**	**1E-04**	**3E-05**	**4E-05**	**6E-05**	**3E-05**	**4E-05**	**5E-05**	**6E-05**
Child Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1E-05	7E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	2E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	8E-07	6E-07	7E-07	1E-06	5E-07	8E-07	8E-07	1E-06
ELCR	1E-05	**8E-05**	**2E-05**	1E-05	**2E-05**	**3E-05**	1E-05	**2E-05**	**2E-05**	**3E-05**
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	3E-03	4E-03	1E-03	3E-04	5E-04	3E-04	7E-04	2E-03	2E-06	5E-04
Inhalation	5E-10	8E-12	5E-11	2E-09	6E-07	2E-09	4E-08	2E-06	2E-08	3E-10
Fruits, Vegetables and Grains Ingestion	1E-03	1E-03	6E-04	1E-04	2E-04	3E-04	4E-04	4E-03	2E-05	3E-04
Meat Ingestion	6E-04	8E-04	4E-04	1E-04	2E-04	1E-07	2E-04	5E-04	1E-06	2E-04
Soil Ingestion	2E-05	7E-06	6E-06	3E-06	3E-06	4E-06	7E-06	8E-05	3E-06	6E-06
ELCR	**6E-03**	**6E-03**	**2E-03**	**6E-04**	**9E-04**	**1E-03**	**1E-03**	**6E-03**	**2E-05**	**1E-03**
Adult Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.6	1.1	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.7
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	1E-02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.6	**1.1**	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.7
Child Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	2.9	5.1	3.2	2.8	3.3	3.4	2.7	3.2	3.5	3.2
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	0.02	0.08	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.03
Hazard Index	**2.9**	**5.2**	**3.2**	**2.8**	**3.3**	**3.4**	**2.7**	**3.2**	**3.5**	**3.2**

ELCR = excess lifetime cancer risk

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

3.1.5.11 Risk Characterization Results for Yakama National Resident Receptor.

Table 3-13 provides a summary of the cancer risks and non-cancer hazard by exposure route for each EA, respectively. Like other residential receptors, risk characterization of nonradiological COPCs was performed for adult and child, separately. Age-weighted intake parameters were utilized during radiological risk characterization. Appendix C, Attachment C-12 and Attachment C-13 include the intake and risk calculations for all 10 EAs under Yakama resident adult and CTUIR resident child receptor scenario, respectively. Appendix D, Attachment D-8 presents the results of maximum radiological dose and risk assessments over a period of 1,000 years under Yakama residential receptor scenario. The risk characterization was performed for information purposes.

3.1.6 Groundwater Protection Pathway

As mentioned earlier, an assessment referred to as the "protection of groundwater pathway" was performed as part of the WMA C RA to understand the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer. Soil samples collected from both shallow zone (0 to 15 ft bgs) and deep vadose zone (>15 ft bgs) were utilized to perform the assessment for protection of groundwater pathway. Additional evaluation was performed for radiological COPCs in the vadose zone in this RA using models developed in support of the WMA C Performance Assessment.

3.1.6.1 Evaluation of Nonradiological Contaminants Using MTCA Three Phase Model.

During this RA, nonradiological contaminants in the vadose zone were initially evaluated to the 2013 WAC 173-340-747 subsection (4) "Fixed-parameter three-phase partitioning model" (hereinafter referred to as the three-phase model) cleanup levels. Prior to performing this evaluation, protective soil concentrations (cleanup levels) for nonradiological COPCs in the vadose zone were derived based on the three-phase model described in WAC 173-340-747, so that derived concentrations will not cause an exceedance of the groundwater cleanup levels established under WAC 173-340-720. Very conservative default assumptions as specified in the regulation were utilized during the derivation of the soil cleanup levels. Documentation of the cleanup level calculations is provided in ECF-HANFORD-10-0442, *Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area*. It should be noted that three-phase model concentrations could not be determined for a number of metals, VOCs, SVOCs and pesticides/herbicides due to the absence of toxicity information or promulgated cleanup levels. This introduced an uncertainty in the groundwater protection evaluation for these contaminants.

The data evaluations were performed in two steps.

- During the first step, individual soil sample results for each detected non-radiological COPC was compared initially with its corresponding protective soil concentration (cleanup levels), derived based on the three-phase partitioning model.

- To facilitate distinguishing between potential site-related contamination and natural soil background conditions, a background evaluation step was also performed. During the

second step, COPCs for which maximum detected concentrations were greater than their corresponding cleanup levels were carried forward into a background evaluation to identify COPCs that exceed both their corresponding cleanup levels and background concentrations. The following reports were utilized to obtain the Hanford soil background concentrations:

- DOE/RL-92-24, Vol. 1, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*
- ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site*
- Memorandum 1221558, "Issues Associated with Establishing Soil Cleanup Levels for Arsenic."

Table 3-14 presents the results of site concentration comparison between the EPCs for COPCs and their corresponding soil cleanup levels based on the three-phase model. When the soil concentrations exceeded their corresponding cleanup levels, a background comparison was performed to compare the maximum detected concentration to the 90th percentile background concentration. The results of the data evaluations showed that the EPCs for three COPCs (cadmium, beta-BHC and lindane) exceeded their corresponding three-phase model concentrations and background levels at a number of exposure areas. The exceedances are summarized in the following.

- Cadmium – For EA E, even though the EPC (2.9 mg/kg) for cadmium is higher than its 90th percentile soil background concentration (0.69 mg/kg), it is below its maximum soil background concentration of 3 mg/kg. For EA R, the EPC (3.1 mg/kg) for cadmium is higher than its 90th percentile soil background concentration. In addition, the EPC is also slightly higher than its maximum soil background concentration (3 mg/kg).

- Lindane – For EA F+G, the EPC is higher than its corresponding three-phase model concentration. No soil background concentration was determined for lindane.

- Beta-BHC – For EAs F+G, L1+L2 and P, the EPCs of beta-BHC, daughter product of lindane, are higher than their corresponding three-phase model concentrations. No soil background concentration was determined for beta-BHC.

A regional scale nitrate plume exists in the groundwater around WMA C that is primarily attributed to upgradient sources. The nitrate in the regional plume likely contains contributions from both WMA C and other sources upgradient of WMA C. As a consequence, it is likely that the nitrate will exceed its DWS in the neighborhood of WMA C from the combination of sources. Nitrate has therefore been retained for further evaluation as a COPC.

Table 3-13. Risk Characterization Results for Yakama Nation Resident Receptor.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F + G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
Adult Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1E-05	8E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	3E-05
Inhalation	1E-08	2E-08	2E-08	1E-08	2E-08	1E-08	1E-08	1E-08	1E-08	1E-08
Dermal Contact	9E-07	5E-06	1E-06	9E-07	1E-06	2E-06	9E-07	1E-06	1E-06	2E-06
ELCR	**2E-05**	**9E-05**	**2E-05**	**1E-05**	**2E-05**	**3E-05**	**2E-05**	**2E-05**	**2E-05**	**3E-05**
Child Carcinogenic Risk – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	1E-05	7E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	2E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	8E-07	6E-07	7E-07	1E-06	5E-07	8E-07	8E-07	1E-06
ELCR	1E-05	**8E-05**	**2E-05**	1E-05	**2E-05**	**3E-05**	1E-05	**2E-05**	**2E-05**	**3E-05**
Carcinogenic Risk – Radiological Contaminants of Potential Concern										
External Gamma	3E-03	3E-03	1E-03	3E-04	4E-04	3E-04	6E-04	2E-03	2E-06	4E-04
Inhalation	5E-10	7E-12	4E-11	2E-09	6E-07	2E-09	5E-08	2E-06	2E-08	3E-10
Fruits, Vegetables and Grains Ingestion	3E-03	2E-03	1E-03	2E-04	4E-04	5E-04	7E-04	7E-03	3E-05	6E-04
Meat Ingestion	2E-03	3E-03	2E-03	5E-04	8E-04	2E-03	8E-04	2E-03	5E-06	8E-04
Milk Ingestion	5E-04	5E-04	3E-04	9E-05	1E-04	3E-04	2E-04	6E-04	2E-06	2E-04
Soil Ingestion	8E-06	3E-06	3E-06	2E-06	1E-06	2E-06	4E-06	4E-05	2E-06	3E-06
ELCR	**8E-03**	**9E-03**	**4E-03**	**1E-03**	**2E-03**	**3E-03**	**2E-03**	**1E-02**	**4E-05**	**2E-03**
Adult Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	0.3	0.5	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hazard Index	0.3	0.6	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Child Non-Cancer Hazard – Nonradiological Contaminants of Potential Concern										
Soil Ingestion	2.9	5.1	3.2	2.8	3.3	3.4	2.7	3.2	3.5	3.2
Inhalation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dermal Contact	0.02	0.08	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.03
Hazard Index	**2.9**	**5.2**	**3.2**	**2.8**	**3.3**	**3.4**	**2.7**	**3.2**	**3.5**	**3.2**

ELCR = excess lifetime cancer risk

The **bold** font indicates exceedances of acceptable ELCR or hazard index limits.

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Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 1 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA A + B										
Aluminum	17	17	5,940,000	10,300,000	7,581,462	95% Approximate Gamma UCL	480,064,000	No	—	
Antimony	17	17	108	342	224.5	95% Student's-t UCL	5,424	No		
Aroclor-1254	7	2	6.46	8.59	8.6	95% KM (Percentile Bootstrap) UCL	114.4	No		
Arsenic	17	17	1,720	5,220	3,191.6	95% Student's-t UCL	34.1	Yes	20,000	No
Barium	17	17	57,800	100,000	78,160.8	95% Student's-t UCL	1,648,000	No	—	
Beryllium	17	1	231	231	231.0	Maximum Detect	63,216	No		
Boron	8	1	6,960	6,960	6,960.0	Maximum Detect	204,800	No		
Cadmium	17	17	37.5	117	83.2	95% Student's-t UCL	690	No		
Chromium (Total)	17	17	5,970	27,700	17,859.6	95% Student's-t UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	17	17	3,290	11,400	7,400.0	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	17	17	8,950	14,200	11,824.0	95% Student's-t UCL	284,160	No	—	
Diethylphthalate	8	2	240	340	340.0	95% KM (Percentile Bootstrap) UCL	72,192.4	No		
Fluoride	17	9	397	2,750	1,132.6	95% KM (t) UCL	2,883,840	No		
Iron	17	17	15,200,000	26,200,000	21,422,289	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	17	17	2,920	11,900	5,550.3	95% Approximate Gamma UCL	3,000,060	No	—	
Lithium	17	17	7,100	10,500	8,981.0	95% Student's-t UCL	192,128	No		
Manganese	17	17	247,000	377,000	320,366.6	95% Student's-t UCL	500,736	No		
Mercury	17	1	23	23	23.0	Maximum Detect	2,088	No		
Nickel	17	17	7,530	18,200	14,830.6	95% Student's-t UCL	130,400	No		
Nitrate	17	15	1,710	121,000	61,879.2	97.5% KM (Chebyshev) UCL	180,000	No		
Nitrite	17	8	303	1,080	638.0	95% KM (Percentile Bootstrap) UCL	13,200	No		
Silver	17	16	28.6	76.9	47.6	95% KM (BCA) UCL	13,600	No		
Strontium	17	17	28,100	67,700	39,437.1	95% Modified-t UCL	6,758,400	No		
Tin	3	3	6,900	11,600	11,600.0	Maximum Detect	48,038,400	No		
Total_U_Isotopes	17	17	407.71	1,904.6	775.3	95% Modified-t UCL	270,120	No		
Vanadium	17	17	29,200	66,500	51,765.7	95% Student's-t UCL	1,600,320	No		
Zinc	17	17	30,700	47,500	41,437.1	95% Approximate Gamma UCL	5,971,200	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 2 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA C										
Aluminum	8	8	5,900,000	9,510,000	8,471,876.5	95% Student's-t UCL	480,064,000	No	—	
Antimony	8	8	55	721	417.8	95% Approximate Gamma UCL	5,424	No		
Arsenic	8	8	2,220	21,200	11,682.1	95% Approximate Gamma UCL	34.1	Yes	20,000	No
Barium	8	8	54,400	98,800	83,845.0	95% Student's-t UCL	1,648,000	No	—	
Beryllium	8	8	181	403	320.6	95% Student's-t UCL	63,216	No		
Butylbenzylphthalate	8	1	80.7	80.7	80.7	Maximum Detect	12,894.7	No		
Cadmium	8	8	70.2	150	110.8	95% Student's-t UCL	690	No		
Chromium (Total)	8	8	9,290	22,200	19,509.2	95% Student's-t UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	Yes
Cobalt	8	8	5,800	11,000	9,228.0	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	8	8	10,200	18,100	14,785.7	95% Student's-t UCL	284,160	No	—	
Fluoride	8	8	507	2,290	1,692.1	95% Approximate Gamma UCL	2,883,840	No		
Iron	8	8	15,500,000	28,600,000	23,682,625	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	8	8	2,390	10,600	6,823.6	95% H-UCL	3,000,060	No	—	
Lithium	8	8	6,570	12,100	9,843.9	95% Student's-t UCL	192,128	No		
Manganese	8	8	237,000	449,000	383,351.2	95% Student's-t UCL	500,736	No		
Mercury	8	2	3.9	5.06	4.4	95% KM (t) UCL	2,088	No		
Nickel	8	8	10,800	18,200	15,791.9	95% Student's-t UCL	130,400	No		
Nitrate	8	8	2,850	17,400	14,191.4	95% Chebyshev (Mean, Sd) UCL	180,000	No		
Nitrite	8	8	424	2,110	1,952.0	95% Student's-t UCL	13,200	No		
Silver	8	4	38.9	80	55.4	95% KM (t) UCL	13,600	No		
Strontium	8	8	29,200	44,700	38,550.6	95% Student's-t UCL	6,758,400	No		
Total_U_Isotopes	8	8	395.71	845.4	651.4	95% Student's-t UCL	270,120	No		
Vanadium	8	8	30,800	78,500	58,725.3	95% Student's-t UCL	1,600,320	No		
Zinc	8	8	30,500	51,100	43,851.2	95% Student's-t UCL	5,971,200	No		
2-Butanone	8	1	6.58	6.58	6.6	Maximum Detect	19,652.3	No		
Acetone	8	4	4.14	6.63	5.6	95% KM (Percentile Bootstrap) UCL	28,902.6	No		
Aldrin	4	1	2	2	2.0	Maximum Detect	2.5	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 3 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA E										
Aluminum	8	8	6,680,000	9,330,000	7,946,314.3	95% Modified-t UCL	480,064,000	No	—	
Antimony	8	8	92.6	263	185.8	95% Student's-t UCL	5,424	No		
Arsenic	8	8	2,240	5,200	4,307.7	95% Student's-t UCL	34.1	Yes	20,000	No
Barium	8	8	53,200	99,900	84,454.0	95% Student's-t UCL	1,648,000	No	—	
Beryllium	8	8	125	195	172.0	95% Student's-t UCL	63,216	No		
Boron	8	3	3,100	3,340	3,340.0	95% KM (Percentile Bootstrap) UCL	204,800	No		
Butylbenzylphthalate	8	5	110	125	123.6	95% KM (Percentile Bootstrap) UCL	12,894.7	No		
Cadmium	8	8	1,760	3,260	2,909.3	95% Student's-t UCL	690	Yes	563	Yes
Chromium (Total)	8	8	7,980	29,800	22,986.0	95% Student's-t UCL	2,000,400	No	—	
Chromium (hexavalent)							960	Yes	18,500	Yes
Cobalt	8	8	5,590	11,300	8,949.9	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	8	8	9,490	16,500	14,223.8	95% Student's-t UCL	284,160	No	—	
Fluoride	8	8	171	2,870	1,781.6	95% Student's-t UCL	2,883,840	No		
Iron	8	8	15,100,000	24,200,000	22,571,805	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lithium	8	8	7,030	10,800	9,154.7	95% Student's-t UCL	192,128	No	—	
Manganese	8	8	265,000	495,000	376,937.9	95% Modified-t UCL	500,736	No		
Mercury	8	1	23.2	23.2	23.2	Maximum Detect	2,088	No		
Molybdenum	8	1	2,540	2,540	2,540.0	Maximum Detect	32,320	No		
Nickel	8	8	7,820	25,300	17,732.0	95% Student's-t UCL	130,400	No		
Nitrate	8	8	2,320	8,920	5,973.8	95% Student's-t UCL	180,000	No		
Nitrite	8	8	721	1,470	1,245.2	95% Student's-t UCL	13,200	No		
Selenium	8	8	195	568	443.7	95% Student's-t UCL	5,200	No		
Silver	8	8	46.4	85	77.2	95% Student's-t UCL	13,600	No		
Strontium	8	8	28,900	56,200	41,280.9	95% Approximate Gamma UCL	6,758,400	No		
Styrene	1	1	0.78	0.8	0.8	Maximum Detect	2,243.6	No		
Toluene	8	7	0.23	0.7	0.5	95% KM (t) UCL	4,653.7	No		
Total_U_Isotopes	8	8	539.57	856.9	742.7	95% Student's-t UCL	270,120	No		
Vanadium	8	8	29,600	63,700	56,045.6	95% Student's-t UCL	1,600,320	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 4 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA E (continued)										
Zinc	8	8	31,200	44,800	42,179.5	95% Student's-t UCL	5,971,200	No	—	
2-Butanone	19	5	2.22	3.18	2.6	95% KM (Percentile Bootstrap) UCL	19,652.3	No		
2-Hexanone	1	1	4.24	4.24	4.2	Maximum Detect	172.2	No		
4-Methyl-2-pentanone	19	2	2.03	2.04	2.0	95% KM (t) UCL	2,727.5	No		
EA F + G										
Aluminum	19	19	4,480,000	7,440,000	6,424,076.4	95% Student's-t UCL	480,064,000	No	—	
Antimony	19	6	120	262	205.2	95% KM (Percentile Bootstrap) UCL	5,424	No		
Aroclor-1260	8	1	20.6	20.6	20.6	Maximum Detect	719.4	No		
Arsenic	19	19	1,700	4,300	3,026.1	95% Student's-t UCL	34.1	Yes	20,000	No
Barium	19	19	40,600	129,000	76,675.4	95% Approximate Gamma UCL	1,648,000	No	—	
Beryllium	19	4	181	298	222.6	95% KM (Percentile Bootstrap) UCL	63,216	No		
beta-BHC	5	4	21.3	25.3	25.2	95% KM (Percentile Bootstrap) UCL	2.3	Yes	NA	Yes
Bis(2-ethylhexyl) phthalate	19	8	667	7,420	2,057.6	95% KM (t) UCL	13,358.8	No	—	
Butylbenzylphthalate	19	2	48.8	72.6	72.6	95% KM (Percentile Bootstrap) UCL	12,894.7	No		
Cadmium	19	12	47.2	143	89.0	95% KM (t) UCL	690	No		
Chromium (Total)	19	19	4,740	22,100	13,428.4	95% Student's-t UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	19	19	3,900	8,760	6,834.8	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	19	19	6,680	15,600	11,321.2	95% Student's-t UCL	284,160	No	—	
Fluoride	19	19	459	3,290	1,474.9	95% Approximate Gamma UCL	2,883,840	No		
Gamma-BHC (Lindane)	2	1	5.1	5.1	5.1	Maximum Detect	2.5	Yes	NA	Yes
Hexane	9	9	2.12	35.9	20.8	95% Student's-t UCL	NC	NE	NA	NE
Iron	19	19	12,100,000	25,900,000	19,172,583	95% Approximate Gamma UCL	5,644,800	Yes	32,600,000	No
Lead	19	12	3,160	9,720	5,271.0	95% KM (Percentile Bootstrap) UCL	3,000,060	No	—	
Lithium	19	19	3,350	10,500	8,183.5	95% Student's-t UCL	192,128	No		
Manganese	19	19	213,000	500,000	319,066.8	95% Approximate Gamma UCL	500,736	No		
Mercury	19	1	30.4	30.4	30.4	Maximum Detect	2,088	No		
Methylene chloride	19	7	2	2.8	2.1	95% KM (Percentile Bootstrap) UCL	21.8	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 5 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA F + G (continued)										
Molybdenum	19	1	2,110	2,110	2,110.0	Maximum Detect	32,320	No	—	
Nickel	19	19	6,400	17,600	12,966.6	95% Student's-t UCL	130,400	No		
Nitrate	19	19	1,940	192,000	79,774.4	95% Chebyshev (Mean, Sd) UCL	180,000	No		
Nitrite	19	18	302	4,080	2,368.5	95% KM (t) UCL	13,200	No		
o-Xylene	19	1	0.13	0.1	0.1	Maximum Detect	14,702.72	No		
Silver	19	4	70.7	82.7	82.0	95% KM (Percentile Bootstrap) UCL	13,600	No		
Strontium	19	19	21,700	49,700	32,324.8	95% Approximate Gamma UCL	6,758,400	No		
Styrene	6	6	0.25	0.7	0.6	95% Approximate Gamma UCL	2,243.6	No		
Tin	1	1	6,360	6,360	6,360.0	Maximum Detect	48,038,400	No		
Toluene	19	9	0.16	1.0	0.3	95% KM (Percentile Bootstrap) UCL	4,653.7	No		
Total_U_Isotopes	19	19	362.68	1,019.2	566.0	95% Modified-t UCL	270,120	No		
Vanadium	19	19	24,400	78,500	49,714.7	95% Approximate Gamma UCL	1,600,320	No		
Xylenes (total)	19	1	0.46	0.5	0.5	Maximum Detect	14,629.76	No		
Zinc	19	19	25,100	43,100	33,450.9	95% Student's-t UCL	5,971,200	No		
EA H + I										
Aluminum	17	17	4,590,000	7,900,000	6,864,009	95% Student's-t UCL	480,064,000	No	—	
Antimony	17	17	77.9	420	195.6	95% Approximate Gamma UCL	5,424	No		
Arsenic	17	17	2,000	7,000	4,164.8	95% Approximate Gamma UCL	34.1	Yes	20,000	No
Barium	17	17	57,000	103,000	81,678.5	95% Student's-t UCL	1,648,000	No	—	
Beryllium	17	16	112	215	185.7	95% KM (t) UCL	63,216	No		
Bis(2-ethylhexyl) phthalate	17	2	1,010	5,620	5,620.0	95% KM (BCA) UCL	13,358.8	No		
Butylbenzylphthalate	17	1	200	200	200.0	Maximum Detect	12,894.7	No		
Cadmium	17	16	58.2	196	110.4	95% KM (BCA) UCL	690	No		
Chromium (Total)	17	17	5,340	28,700	18,340.3	95% Student's-t UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	17	17	4,500	11,300	8,757.8	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	17	17	9,040	13,500	11,429.3	95% Student's-t UCL	284,160	No	—	
Di-n-butylphthalate	17	1	570	570	570.0	Maximum Detect	56,640.0	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 6 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA H + I (continued)										
Fluoride	17	17	372	2,100	1,335.0	95% Student's-t UCL	2,883,840	No	—	
Iron	17	17	14,100,000	31,200,000	21,813,131	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	17	17	2,460	11,300	6,763.9	95% Student's-t UCL	3,000,060	No	—	
Lithium	17	17	3,560	10,500	8,249.6	95% Student's-t UCL	192,128	No		
Manganese	17	17	250,000	465,000	362,091.4	95% Student's-t UCL	500,736	No		
Molybdenum	17	2	1,980	2,000	2,000.0	95% KM (Percentile Bootstrap) UCL	32,320	No		
Nickel	17	17	6,610	18,300	14,618.0	95% Student's-t UCL	130,400	No		
Nitrate	17	17	2,750	54,600	18,642.6	95% Approximate Gamma UCL	180,000	No		
Nitrite	17	15	232	1,850	977.5	95% KM (Percentile Bootstrap) UCL	13,200	No		
Selenium	17	17	345	1,000	873.6	95% Student's-t UCL	5,200	No		
Silver	17	9	44.3	66.7	59.8	95% KM (t) UCL	13,600	No		
Strontium	17	17	20,200	37,700	33,088.6	95% Student's-t UCL	6,758,400	No		
Styrene	14	12	0.27	0.5	0.4	95% KM (t) UCL	2,243.6	No		
Toluene	17	14	0.27	1.1	0.5	95% KM (BCA) UCL	4,653.7	No		
Total_U_Isotopes	17	17	417.09	989.0	596.2	95% Modified-t UCL	270,120	No		
Vanadium	17	17	24,500	82,600	52,974.5	95% Approximate Gamma UCL	1,600,320	No		
Zinc	17	17	29,500	53,000	39,607.0	95% Student's-t UCL	5,971,200	No		
EA J										
Aluminum	9	9	5,740,000	7,740,000	7,009,023.2	95% Student's-t UCL	480,064,000	No	—	
Antimony	9	9	121	2,160	1,360.0	95% Chebyshev (Mean, Sd) UCL	5,424	No		
Arsenic	9	9	2,160	7,890	5,156.3	95% Approximate Gamma UCL	34.1	Yes	20,000	No
Barium	9	9	55,400	244,000	126,677.6	95% Modified-t UCL	1,648,000	No	—	
Beryllium	9	9	114	328	206.1	95% Modified-t UCL	63,216	No		
Bis(2-ethylhexyl) phthalate	9	1	2,070	2,070	2,070.0	Maximum Detect	13,358.8	No		
Boron	8	8	2,740	43,900	30,907.1	95% Chebyshev (Mean, Sd) UCL	204,800	No		
Butylbenzylphthalate	9	3	77.8	85.5	85.5	95% KM (Percentile Bootstrap) UCL	12,894.7	No		
Cadmium	9	9	59.2	113	93.0	95% Student's-t UCL	690	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 7 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA J (continued)										
Chromium (Total)	9	9	8,840	27,400	17,272.9	95% Approximate Gamma UCL	2,000,400	No	—	
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	9	9	4,500	8,270	6,730.6	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	9	9	8,780	13,800	12,312.8	95% Student's-t UCL	284,160	No	—	
Fluoride	9	9	502	1,880	1,413.8	95% Student's-t UCL	2,883,840	No		
Iron	9	9	14,600,000	24,100,000	20,095,428	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	9	9	2,550	5,290	4,740.5	95% Student's-t UCL	3,000,060	No	—	
Lithium	9	9	6,990	10,300	8,789.2	95% Student's-t UCL	192,128	No		
Manganese	9	9	231,000	383,000	322,511.6	95% Student's-t UCL	500,736	No		
Mercury	9	2	11.5	16.2	16.2	95% KM (Percentile Bootstrap) UCL	2,088	No		
Molybdenum	9	1	3,580	3,580	3,580.0	Maximum Detect	32,320	No		
Nickel	9	9	9,180	16,500	13,274.2	95% Student's-t UCL	130,400	No		
Nitrate	9	9	3,240	18,800	12,482.4	95% Student's-t UCL	180,000	No		
Nitrite	9	8	394	2650	2,027.2	95% KM (t) UCL	13,200	No		
Silver	9	9	45.1	62.4	55.9	95% Student's-t UCL	13,600	No		
Strontium	9	9	26,100	125,000	61,909.4	95% Modified-t UCL	6,758,400	No		
Tin	6	6	2,020	5,490	4,570.8	95% Student's-t UCL	48,038,400	No		
Toluene	1	1	220	220	220.0	Maximum Detect	4,653.7	No		
Total_U_Isotopes	9	9	437.55	650.4	589.6	95% Student's-t UCL	270,120	No		
Vanadium	9	9	30,200	54,300	45,852.7	95% Student's-t UCL	1,600,320	No		
Zinc	9	9	31,500	52,300	41,215.9	95% Modified-t UCL	5,971,200	No		
1-Butanol	17	1	22.2	22.2	22.2	Maximum Detect	NA	NE	NA	NE
Acetone	17	6	3.08	72.5	24.0	95% KM (Percentile Bootstrap) UCL	28,902.6	No	—	
EA L1 + L2										
Aluminum	16	16	4,560,000	8,530,000	6,699,353.0	95% Student's-t UCL	480,064,000	No	—	
Antimony	17	10	74.1	500	202.8	95% KM (Percentile Bootstrap) UCL	5,424	No		
Arsenic	17	17	1,700	4520	3,064.7	95% Student's-t UCL	34.1	Yes	20,000	No
Barium	17	17	46,600	106,000	71,770.1	95% Student's-t UCL	1,648,000	No	—	

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 8 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA L1 + L2 (continued)										
Benzene	17	1	0.40	0.4	0.4	Maximum Detect	4.5	No	—	
Beryllium	17	11	111	216	172.7	95% KM (Percentile Bootstrap) UCL	63,216	No		
beta-BHC	8	4	19.4	23.4	22.7	95% KM (Percentile Bootstrap) UCL	2.3	Yes	NA	Yes
Bis(2-ethylhexyl) phthalate	17	3	1,260	1,840	1,371.1	95% KM (t) UCL	13358.8	No	—	
Butylbenzylphthalate	17	2	53.6	59.2	55.2	95% KM (t) UCL	12,894.7	No		
Cadmium	17	17	32.3	120	76.3	95% Approximate Gamma UCL	690	No		
Chromium (Total)	17	17	7,540	32,200	16,797.5	95% Approximate Gamma UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	17	17	4,340	10,700	7,374.7	95% H-UCL	4,339.2	Yes	15,700	No
Copper	17	17	7,370	27,100	13,177.7	95% Modified-t UCL	284,160	No	—	
Fluoride	17	17	379	2,380	1,394.6	95% Student's-t UCL	2,883,840	No		
Hexane	9	9	1.62	60.5	34.3	95% Student's-t UCL	NA	NE	NA	NE
Iron	17	17	12,600,000	25,900,000	19,053,386	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	17	17	2,580	13,800	5,905.1	95% Approximate Gamma UCL	3,000,060	No	—	
Lithium	17	17	5,550	9,590	8,221.3	95% Student's-t UCL	192,128	No		
Manganese	17	17	169,000	450,000	312,493.6	95% Student's-t UCL	500,736	No		
Mercury	17	3	10.2	68.1	21.7	95% KM (t) UCL	2,088	No		
Molybdenum	17	3	2,260	5,120	2,803.1	95% KM (t) UCL	32,320	No		
Nickel	17	17	7,330	20,200	13,330.4	95% Student's-t UCL	130,400	No		
Nitrate	17	17	1,920	90,300	49,812.2	95% Chebyshev (Mean, Sd) UCL	180,000	No		
Nitrite	17	13	982	5,180	2,859.0	95% KM (t) UCL	13,200	No		
Selenium	17	1	1,350	1,350	1,350.0	Maximum Detect	5,200	No		
Silver	17	13	33.7	102	65.5	95% KM (t) UCL	13,600	No		
Strontium	17	17	19,000	46,100	32,145.3	95% Student's-t UCL	6,758,400	No		
Styrene	2	2	0.44	0.5	0.5	Maximum Detect	2,243.6	No		
Toluene	17	3	0.31	0.3	0.3	95% KM (t) UCL	4,653.7	No		
Total_U_Isotopes	17	17	317.72	980.3	567.4	95% Approximate Gamma UCL	270,120	No		
Vanadium	17	17	27,800	71,600	48,704.4	95% Approximate Gamma UCL	1,600,320	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 9 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA L1 + L2 (continued)										
Zinc	17	17	24,200	52,700	36,440.7	95% Approximate Gamma UCL	5,971,200	No	—	
1,1-Dichloroethene	25	1	0.32	0.3	0.3	Maximum Detect	50.1	No		
Acetone	25	16	2.95	13.1	6.7	95% KM (Percentile Bootstrap) UCL	28,902.6	No		
EA P										
Aluminum	26	26	3,790,000	7,800,000	6,445,915.6	95% Student's-t UCL	480,064,000	No	—	
Antimony	26	3	174	367	367.0	95% KM (Percentile Bootstrap) UCL	5,424	No		
Aroclor-1260	8	2	25.2	26.8	26.8	95% KM (Percentile Bootstrap) UCL	719.4	No		
Arsenic	26	25	1,730	11,200	4,601.6	95% KM (BCA) UCL	34.1	Yes	20,000	No
Barium	26	26	51,700	99,100	73,405.0	95% Student's-t UCL	1,648,000	No	—	
Beryllium	26	12	191	315	236.2	95% KM (Percentile Bootstrap) UCL	63,216	No		
beta-BHC	4	4	21.2	25.8	25.8	Maximum Detect	2.3	Yes	NA	Yes
Bis(2-ethylhexyl) phthalate	22	10	673	5,050	1,735.5	95% KM (Percentile Bootstrap) UCL	13,358.8	No	—	
Cadmium	26	23	47.4	1,690	513.0	95% KM (Chebyshev) UCL	690	No	563	No
Carbon disulfide	25	1	0.26	0.3	0.3	Maximum Detect	5,650.7	No	—	
Chromium (Total)	26	26	4,470	32,700	14,356.5	95% Approximate Gamma UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	26	26	4,050	10,500	7,713.1	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	26	26	6,830	14,600	11,937.0	95% Student's-t UCL	284,160	No	—	
Di-n-butylphthalate	22	4	645	863	863.0	95% KM (Percentile Bootstrap) UCL	56,640.0	No		
Ethylene glycol	13	2	610	1,030	810.0	95% KM (t) UCL	64,320.1	No		
Fluoride	25	25	431	7,410	2,507.4	95% Approximate Gamma UCL	2,883,840	No		
Iron	26	26	12,400,000	30,500,000	21,039,825	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	26	25	2,720	14,100	6,517.1	95% KM (BCA) UCL	3,000,060	No	—	
Lithium	26	26	4,190	10,700	7,899.0	95% Student's-t UCL	192,128	No		
Manganese	26	26	193,000	412,000	319,465.0	95% Student's-t UCL	500,736	No		
Mercury	24	2	13.2	19.2	19.2	95% KM (Percentile Bootstrap) UCL	2,088	No		
Methylene chloride	25	5	0.20	2.6	1.0	95% KM (Percentile Bootstrap) UCL	21.8	No		
Nickel	26	26	6,710	30,600	13,963.0	95% Approximate Gamma UCL	130,400	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 10 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA P (continued)										
Nitrate	25	25	3,060	143,000	39,169.5	95% Chebyshev (Mean, Sd) UCL	180,000	No	—	
Nitrite	25	20	347	5,760	2,922.1	95% KM (t) UCL	13,200	No		
Silver	26	12	100	933	226.8	95% KM (Percentile Bootstrap) UCL	13,600	No		
Strontium	26	26	17,500	39,100	29,579.9	95% Student's-t UCL	6,758,400	No		
Tin	11	10	6,670	14,400	10,855.5	95% KM (BCA) UCL	48,038,400	No		
Toluene	25	2	0.29	1.4	1.4	Maximum Detect	4,653.7	No		
Total_U_Isotopes	26	26	398.63	6,453.8	2,122.8	95% Chebyshev (Mean, Sd) UCL	270,120	No		
Vanadium	26	26	27,300	110,000	60,784.0	95% Approximate Gamma UCL	1,600,320	No		
Zinc	26	26	25,400	305,000	67,959.3	95% Modified-t UCL	5,971,200	No		
2-Hexanone	3	3	2.08	2.77	2.8	Maximum Detect	172.2	No		
Acetone	8	6	1.2	10	6.1	95% KM (t) UCL	28,902.6	No		
EA R										
Aluminum	8	8	6,120,000	8,390,000	7,627,678.0	95% Student's-t UCL	480,064,000	No	—	
Antimony	7	7	114	303	228.1	95% Student's-t UCL	5,424	No		
Arsenic	8	8	2,530	5,830	4,897.1	95% Student's-t UCL	34.1	Yes	20,000	No
Barium	8	8	51,200	79,200	75,160.8	95% Student's-t UCL	1,648,000	No	—	
Beryllium	8	8	135	175	169.9	95% Student's-t UCL	63,216	No		
Butylbenzylphthalate	8	6	76.1	114	108.9	95% KM (BCA) UCL	12,894.7	No		
Cadmium	8	8	1,160	3,470	3,101.3	95% Student's-t UCL	690	Yes	563	Yes
Chromium (Total)	8	8	9,250	14,700	13,067.7	95% Student's-t UCL	2,000,400	No	—	
Chromium (hexavalent)							960	Yes	18,500	No
Cobalt	8	8	5,880	10,500	9,688.0	95% Student's-t UCL	4,339.2	Yes	15,700	No
Copper	8	8	8,430	14,800	12,723.6	95% Student's-t UCL	284,160	No	—	
Fluoride	8	8	597	3,530	2,548.9	95% Student's-t UCL	2,883,840	No		
Iron	8	8	12,500,000	25,900,000	23,839,162	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	8	8	3,190	8,450	6,095.1	95% Approximate Gamma UCL	3,000,060	No	—	
Lithium	8	8	7,010	9,050	8,443.2	95% Student's-t UCL	192,128	No		

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 11 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA R (continued)										
Manganese	8	8	247,000	409,000	365,183.1	95% Student's-t UCL	500,736	No	—	
Mercury	8	1	13.5	13.5	13.5	Maximum Detect	2,088	No		
Methylene chloride	8	4	1.1	6.9	3.5	95% KM (Percentile Bootstrap) UCL	21.8	No		
Nickel	8	8	8,690	14,600	13,211.9	95% Student's-t UCL	130,400	No		
Nitrate	8	8	1,470	39,700	33,158.6	95% Approximate Gamma UCL	180,000	No		
Nitrite	8	7	387	5,310	3,420.8	95% KM (t) UCL	13,200	No		
Selenium	8	8	317	701	607.8	95% Student's-t UCL	5,200	No		
Silver	8	8	36.2	69.4	56.9	95% Student's-t UCL	13,600	No		
Strontium	8	8	28,400	37,300	33,864.5	95% Student's-t UCL	6,758,400	No		
Toluene	8	4	0.26	0.6	0.5	95% KM (t) UCL	4,653.7	No		
Total_U_Isotopes	8	8	377.94	659.9	559.8	95% Student's-t UCL	270,120	No		
Trichloromonofluoromethane	8	3	2.3	11	11.0	95% KM (Percentile Bootstrap) UCL	28,203.9	No		
Vanadium	8	8	20,200	64,200	58,953.8	95% Student's-t UCL	1,600,320	No		
Zinc	8	8	27,100	48,600	44,594.9	95% Student's-t UCL	5,971,200	No		
2-Butanone	7	1	13.8	13.8	13.8	Maximum Detect	19,652.3	No		
Acetone	7	3	5.96	25.7	25.7	95% KM (Percentile Bootstrap) UCL	28,902.6	No		
EA U										
Aluminum	7	7	4,960,000	8,370,000	7,794,280.7	95% Student's-t UCL	480,064,000	No	—	
Antimony	6	4	139	291	274.3	95% KM (t) UCL	5,424	No		
Arsenic	7	7	3,000	20,000	12,340.8	95% Approximate Gamma UCL	34.1	Yes	20,000	No
Barium	7	7	48,100	96,900	81,900.8	95% Student's-t UCL	1,648,000	No	—	
Benzene	7	1	0.33	0.3	0.3	Maximum Detect	4.5	No		
Beryllium	7	7	126	235	226.2	95% Student's-t UCL	63,216	No		
Boron	1	1	6,420	6,420	6,420.0	Maximum Detect	204,800	No		
Cadmium	7	3	125	190	190.0	95% KM (Percentile Bootstrap) UCL	690	No		
Chromium (Total)	7	7	7,460	44,500	36,754.4	95% Chebyshev (Mean, Sd) UCL	2,000,400	No		
Chromium (hexavalent)							960	Yes	18,500	Yes
Cobalt	7	7	4,060	8,730	7,966.6	95% Student's-t UCL	4,339.2	Yes	15,700	No

Table 3-14. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model. (sheet 12 of 12)

Analyte	Total # of Samples	# of Detects	Concentration (unit in µg/kg)				3-Phase Model Concentration Comparison		Background Comparison	
			Minimum	Maximum	Exposure Point		3-Phase Model	Is EPC> 3 Phase Concentration?	Lognormal 90th Percentile Background Value	Is EPC> Background Concentration?
					Value	Basis				
EA U (continued)										
Copper	7	7	7,510	13,200	12,335.8	95% Student's-t UCL	284,160	No	—	
Fluoride	7	7	402	2,020	1,611.1	95% Student's-t UCL	2,883,840	No		
Hexane	1	1	4.16	4.16	4.2	Maximum Detect	NA	NE	NA	NE
Iron	7	7	11,800,000	23,100,000	20,676,810	95% Student's-t UCL	5,644,800	Yes	32,600,000	No
Lead	7	7	3,000	10,900	8,592.6	95% Student's-t UCL	3,000,060	No	—	
Lithium	7	7	5,520	11,600	9,622.6	95% Student's-t UCL	192,128	No		
Manganese	7	7	213,000	364,000	322,373.1	95% Student's-t UCL	500,736	No		
Mercury	7	2	10.2	20.6	20.6	95% KM (Percentile Bootstrap) UCL	2,088	No		
Molybdenum	7	3	1,880	2530	2,280.7	95% KM (t) UCL	32,320	No		
Nickel	7	7	6,680	29,400	19,415.6	95% Approximate Gamma UCL	130,400	No		
Nitrate	7	7	4,490	71,600	56,768.8	95% Chebyshev (Mean, Sd) UCL	180,000	No		
Nitrite	7	5	393	2,370	1,723.7	95% KM (Percentile Bootstrap) UCL	13,200	No		
Selenium	7	7	800	2,000	1,395.1	95% Modified-t UCL	5,200	No		
Strontium	7	7	23,000	49,600	40,044.7	95% Student's-t UCL	6,758,400	No		
Styrene	2	2	0.35	0.4	0.4	Maximum Detect	2,243.6	No		
Toluene	7	6	0.56	0.7	0.7	Maximum Detect	4,653.7	No		
Total_U_Isotopes	7	7	353.98	1,391.5	935.1	95% Student's-t UCL	270,120	No		
Vanadium	7	7	22,800	51,900	48,075.6	95% Student's-t UCL	1,600,320	No		
Zinc	7	7	26,000	45,300	40,422.8	95% Student's-t UCL	5,971,200	No		

3.2 HUMAN HEALTH RISK ASSESSMENT BASED ON SAMPLE-BY-SAMPLE APPROACH

Human health risk evaluations were performed for 5 of the 11 risk scenarios listed in Section 3.1.5 of this document using a sample-by-sample evaluation in accordance with the decision/determination/action items stated in the HFFACO IAMIT Determination 2019-006. These 5 scenarios are as follows:

- Radiological Human Health Risk Evaluations for the CERCLA Residential and Industrial scenarios,
- Nonradiological Human Health Risk Evaluations for the WAC Industrial Worker scenario and WAC Residential scenario;
- Assessment of Groundwater Protection Pathway for Nonradiological Contaminants using the fixed-parameter three-phase model.

Detailed information related to these scenarios are summarized in the following sections.

3.2.1 Radiological Human Health Risk Evaluation for the CERCLA Industrial and Residential Scenarios

Radiological risk evaluations for detected soil radiological COPCs for the ten EAs at WMA C were performed using a sample-by-sample approach for both the CERCLA industrial worker and CERCLA residential receptor scenarios. Individual human health risk evaluations were performed for each sample depth interval within a borehole. In conducting the sample-by-sample RA, only the basis for source term (EPC) concentration was changed (non-statistical approach); no change was made to receptor exposure assumptions and the toxicity assessment.

3.2.1.1 Identification and Determination of Source-term Concentrations for Contaminants of Potential Concern. Radiological risks are evaluated for each depth interval within a borehole over a period of 1,000 years. When only one sample was collected from a borehole, the detected concentrations for COPCs in the sample were used as the source-term concentrations. When multiple samples were collected from the same depth interval in a borehole (i.e., reflecting different sampling events), the maximum soil concentration for each detected COPC was used as the source-term concentration. For example, two samples, B2B1L8 and B2B1L9, were collected at the same sample depth (0 to 1 ft) within well C8102 with multiple detections of ^{137}Cs and ^{90}Sr. The maximum concentrations of 4.37 pCi/g (B2B1L8) and 24 pCi/g (B2B1L9) were used as the source-term concentrations at the depth interval of 0 to 1 ft for ^{137}Cs and ^{90}Sr, respectively. The source-term concentrations for each of the ten EAs within WMA C are summarized in Tables 3-15 through 3-24.

Table 3-15. Radiological Source-Term Soil Concentrations for Exposure Area A+B.

Borehole Name	C8102					C8104				
Sample ID	B2B1L8	B2B1L9	B2D1X2	B2D1X4	B2D1X5	B2FB27	B2FB29	B2FB30	B2FPF1	B2FPF2
Top (feet)	0	0	5.7	11.5	16.1	5.7	11.5	16.1	0.5	0.5
Bottom (feet)	1	1	9.7	15.5	18.1	7.7	15.5	18.1	1	1
Contaminant of Potential Concern	Soil Concentration (pCi/g)									
Am-241	—	—	—	0.06	—	—	—	0.04	0.18	—
C-14	—	2.23	—	3.39	—	—	1.23	—	—	—
Cs-137	4.37	—	—	—	—	—	—	—	27.7	—
Pu-239/240	—	—	—	—	—	—	—	—	0.31	—
Pu-241	—	—	—	—	—	—	—	—	1.17	—
Se-79	—	—	—	—	—	—	—	2.19	2.70	—
Sn-126	26.0	—	23.6	18.4	47.0	14.1	17.1	25.2	28.1	—
Sr-90	—	24.0	—	—	—	—	—	—	—	11.8
U-234	—	0.18	0.24	0.25	0.24	—	0.17	0.19	0.33	—
U-235	—	0.01	0.01	0.01	0.01	0.01	0.01	0.01	—	0.01
U-238	—	0.15	0.19	0.15	0.16	0.14	0.14	0.18	—	0.24

Table 3-16. Radiological Source-Term Soil Concentrations for Exposure Area C.

Borehole Name	C8106			
Sample ID	B2FPR7	B2FPR8	B2FYM3	B2FYM4[c]
Top (feet)	1	1	11	19
Bottom (feet)	1.5	1.5	13	21
Contaminant of Potential Concern	Soil Concentration (pCi/g)			
Cs-137	—	7.09	—	—
Ni-63	—	—	4.50	—
Sn-126	—	25.0	53.1	20.7
Sr-90	—	3.0	—	—
U-235	0.01	—	0.01	0.01
U-238	0.18	—	0.28	0.19

Table 3-17. Radiological Source-Term Soil Concentrations for Exposure Area E.

Borehole Name	C7672				
Sample ID	B26C68	B26C70	B26C74	B26JK2	B26JK3
Top (feet)	5	10	14	0	0
Bottom (feet)	7	12	16	1	1
Contaminant of Potential Concern	Soil Concentration (pCi/g)				
Cs-137	—	—	—	5.13	—
Se-79	1.64	3.77	1.58	2.15	—
Sn-126	5.84	3.75	3.76	18.5	—
Sr-90	—	—	—	2.50	—
U-233	2.0	1.72	1.59	—	1.95
U-234	0.19	—	0.45	—	0.24
U-235	0.01	0.01	0.01	—	0.01
U-238	0.20	0.19	0.28	—	0.24

Table 3-18. Radiological Source-Term Soil Concentrations for Exposure Area F + G.

Borehole Name	C7468				C7472				
Sample ID	B211Y3	B211Y6	B211Y9	B215L0	B236N5	B236N8	B236P2	B238H1	B23KT4
Top (feet)	5	10	14	0	0	0	5	14	10
Bottom (feet)	7	12	16	1	1	1	7	16	14
Contaminant of Potential Concern	Soil Concentration (pCi/g)								
C-14	—	—	—	—	3.51	—	—	6.07	12.5
Cs-137	—	—	—	4.75	—	2.07	—	—	—
Se-79	—	—	—	—	—	—	2.42	—	—
Sn-126	—	—	—	—	2.55	—	—	—	—
Sr-90	—	—	—	—	0.30	—	—	0.30	—
U-233	1.06	0.62	0.75	2.21	1.20	—	1.35	0.94	0.77
U-234	—	0.18	0.18	0.26	—	0.30	0.42	—	—
U-235	0.01	0.01	0.01	0.01	0.01	—	0.01	0.01	0.01
U-238	0.15	0.13	0.14	0.26	0.17	—	0.34	0.16	0.15

Table 3-19. Radiological Source-Term Soil Concentrations for Exposure Area H + I.

Borehole Name	C7680					C7682				
Sample ID	B26C26	B26C28	B26C30	B26JK8	B26JK9	B26C47	B26C51	B26C53	B26JL0	B26JL1
Top (feet)	5	10	14	0	0	5	12	14	0	0
Bottom (feet)	7	12	16	1	1	7	14	16	1	1
Contaminant of Potential Concern	Soil Concentration (pCi/g)									
C-14	—	—	—	—	—	3.49	—	—	—	—
H-3	—	—	—	75.8	—	—	2.93	5.06	—	2.91
Se-79	2.23	2.65	—	—	—	—	—	—	—	—
Sn-126	6.77	—	3.89	—	7.24	8.54	3.42	5.42	—	9.76
U-233	1.38	0.58	1.36	1.44	—	1.97	1.04	1.29	1.81	—
U-234	0.26	0.30	—	0.35	—	—	—	—	—	—
U-235	0.01	0.01	0.01	0.01	—	0.01	0.01	0.01	—	0.01
U-238	0.18	0.16	0.17	0.16	—	0.16	0.17	0.19	—	0.19

Table 3-20. Radiological Source-Term Soil Concentrations for Exposure Area J.

Borehole Name	C8100			
Sample ID	B2B1L6	B2B1L7	B2C1M2	B2C1M3
Top (feet)	0	0	5.7	15
Bottom (feet)	1	1	7.7	19
Contaminant of Potential Concern	Soil Concentration (pCi/g)			
C-14	—	13.7	—	—
Cs-137	—	5.71	—	—
Pu-238	—	0.07	—	—
Pu-239/240	0.04	—	—	—
Pu-241	0.14	—	—	—
Se-79	—	11.3	3.76	5.19
Sr-90	—	4.01	—	—
U-235	0.01	—	0.01	0.01
U-238	0.22	—	0.19	0.19

Table 3-21. Radiological Source-Term Soil Concentrations for Exposure Area L1 + L2.

Borehole Name	C7466					C7670				
Sample ID	B20XW6	B20XW9	B20XX2	B215K8	B215K9	B238J9	B23KN7	B23R25	B25CN2	B23KP6
Top (feet)	5	10	14	0	0	5	0	0	10	14
Bottom (feet)	7	12	16	1	1	7	1	1	14	16
Contaminant of Potential Concern	Soil Concentration (pCi/g)									
C-14	53.8	—	—	43.7	—	—	—	—	—	4.69
Cs-137	0.44	—	—	—	2.46	—	—	7.52	—	—
H-3	—	—	—	—	—	4.65	—	—	—	—
Ni-63	—	—	—	—	—	—	390.0	—	—	—
Se-79	—	1.60	—	—	—	—	—	—	—	—
Sn-126	—	—	—	—	—	—	3.44	—	—	8.94
Sr-90	—	—	—	—	4.01	0.12	1.45	—	—	—
U-233	1.21	0.44	0.57	—	1.25	1.11	2.08	—	1.52	0.94
U-234	0.14	—	0.24	0.29	—	—	0.26	—	—	0.17
U-235	0.01	—	0.01	—	0.01	0.01	0.01	—	0.01	0.01
U-238	0.25	0.11	0.14	—	0.19	0.15	0.33	—	0.13	0.14

Table 3-22. Radiological Source-Term Soil Concentrations for Exposure Area P.

Borehole Name	C6392	C6400		C6402			C6404		C6406		
Sample ID	B1YT71	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW3	B1YT92	B1YT93	B1YTC9	B1YTD2	B1YTD5
Top (feet)	14	5	10	6	10	14	6	10	5	10	14
Bottom (feet)	16	7	12	8	12	16	8	12	7	12	16
Contaminant of Potential Concern	Soil Concentration (pCi/g)										
Am-241	2.20	—	—	—	—	—	—	—	—	—	—
Co-60	0.83	—	—	—	—	—	—	—	—	—	—
Cs-137	73.1	0.98	0.33	30.8	19.1	15.5	35.0	—	—	—	—
H-3	—	—	308	—	—	—	—	—	—	—	—
I-129	—	0.81	—	—	—	—	—	—	—	—	—
Ni-63	—	—	85.0	—	—	—	—	—	—	—	—
Np-237	1.46	—	—	—	—	—	—	—	—	—	—
Pu-239/240	10.7	—	—	—	—	—	—	—	—	—	—
Pu-241	39.9	—	—	—	—	—	—	—	—	—	—
Se-79	2.50	2.84	4.69	8.69	1.98	5.17	—	—	—	—	2.05
Sr-90	120.0	2.20	—	86.6	67.5	73.4	52.8	141.0	12.8	—	—
Tc-99	24.0	—	—	—	—	—	—	—	—	—	—
U-233	1.30	0.75	1.69	1.62	2.01	2.57	0.98	—	1.20	2.27	1.32
U-234	0.62	0.57	1.39	0.27	0.60	0.39	—	—	0.42	0.15	0.30
U-235	0.03	0.02	0.04	0.01	0.03	0.01	0.01	—	0.02	0.01	0.01
U-238	0.49	0.44	0.88	0.30	0.59	0.24	0.19	—	0.35	0.31	0.23

Table 3-23. Radiological Source-Term Soil Concentrations for Exposure Area R.

Borehole Name	C7668			
Sample ID	B23TK2	B23TK5	B23TK8	B27130
Top (feet)	0	0	5	10
Bottom (feet)	1	1	7	14
Contaminant of Potential Concern	Soil Concentration (pCi/g)			
H-3	—	—	—	2.50
Sr-90	—	0.37	—	—
U-233	—	2.14	2.36	1.84
U-234	0.22	—	0.21	—
U-235	0.01	—	0.01	0.01
U-238	0.19	—	0.22	0.16

Table 3-24. Radiological Source-Term Soil Concentrations for Exposure Area U.

Borehole Name	C7676			
Sample ID	B26CC4	B26JK6	B26JK7	B29612
Top (feet)	10	0	0	5
Bottom (feet)	12	1	1	9
Contaminant of Potential Concern	Soil Concentration (pCi/g)			
C-14	1.66	—	—	—
Cs-137	—	2.06	—	—
Np-237	—	0.60	—	—
Se-79	—		—	2.80
Sn-126	3.75	5.13	—	6.32
Sr-90	—	—	4.20	—
U-233	0.77	—	1.88	2.07
U-234	0.19	—	0.25	0.31
U-235	0.01	—	0.01	0.01
U-238	0.12	—	0.18	0.21

3.2.1.2 Exposure Assumptions for the CERCLA Industrial and Residential Scenarios.

The exposure assumptions and pathways for the CERCLA industrial and residential scenarios are presented in Sections 3.1.2.5.1 and 3.1.2.5.6, respectively.

3.2.1.3 Toxicity Assessments for Radiological Contaminants of Potential Concern. For consistency with the WMA C RA, the sample-by-sample risk evaluation adopts EPA 402-R-99-001 cancer risk coefficient values for all radiological COPCs.

3.2.1.4 Risk Characterization for Radiological Contaminants of Potential Concern. During the risk evaluations, the ELCRs were calculated for each depth interval within a borehole over a period of 1,000 years. Due to longer half-lives of the radiological COPCs, the ELCR evaluation was performed over a 1,000-year time period to account for decay and to incorporate the contribution of the progenies. The methodologies for calculating the ELCRs under each CERCLA receptor scenario are summarized below.

- **Calculation of ELCRs for Each Sample Result** – Similar to the statistical approach, the maximum risk-to-source ratio (risk per unit concentration) over the 1,000-year evaluation period (in units risk per pCi/g) for each COPC was multiplied by its corresponding source term concentration to determine the risk associated with each (COPC-specific risk). The risks for all COPCs within a sample were then summed to determine the sample-specific ELCR ($ELCR_{Sample}$).

- **Calculation of ELCRs for Each Depth Interval within a Borehole** – When only one sample result was collected from a borehole depth interval, the ELCR from that sample depth ($ELCR_{SampleDepth}$) is equal to the sample-specific ELCR ($ELCR_{Sample}$). When more than one sample was collected from the same depth interval within a borehole, all sample-specific ELCR ($ELCR_{Sample}$) results were summed to calculate the ELCR for that depth interval ($ELCR_{SampleDepth}$).

Appendix F presents the RA results for radiological COPCs. The cancer risk for the CERCLA industrial worker scenario for the ten EAs within WMA C are summarized in Tables 3-25 through 3-34. Similarly, the cancers risk for the CERCLA residential scenario for the ten EAs within WMA C are summarized in Tables 3-35 through 3-44.

Table 3-25. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Industrial Worker Scenario.

Borehole Name	C8102					C8104				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
Am-241	—	7E-11	—	1E-10	—	—	4E-11	—	—	—
C-14	2E-05	—	—	—	—	—	—	—	2E-04	—
Cs-137	—	—	—	—	—	—	—	—	6E-09	—
Pu-239/240	—	—	—	—	—	—	—	—	2E-09	—
Pu-241	—	—	—	—	—	—	—	9E-10	1E-09	—
Se-79	3E-04	—	2E-04	2E-04	5E-04	1E-04	2E-04	2E-04	3E-04	—
Sn-126	—	1E-06	—	—	—	—	—	—	—	6E-07
Sr-90	—	2E-09	3E-09	3E-09	3E-09	—	2E-09	2E-09	3E-09	—
U-234	—	1E-08	1E-08	1E-08	1E-08	1E-08	9E-09	1E-08	—	2E-08
U-235	—	5E-08	6E-08	5E-08	5E-08	5E-08	5E-08	6E-08	—	8E-08
U-238	—	—	—	6E-09	—	—	—	4E-09	2E-08	—
$ELCR_{Sample}$[b]	3E-04	1E-06	2E-04	2E-04	5E-04	1E-04	2E-04	2E-04	4E-04	7E-07
$ELCR_{SampleDepth}$[c]	**3E-04**		**2E-04**	**2E-04**	**5E-04**	**1E-04**	**2E-04**	**2E-04**	**4E-04**	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-26. Radiological Risk Assessment Results for Exposure Area C under CERCLA Industrial Worker Scenario.

Borehole Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4[a]**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR[b]**			
Cs-137	—	4E-05	—	—
Ni-63	—	—	4E-10	—
Sn-126	—	2E-04	5E-04	2E-04
Sr-90	—	1E-07	—	—
U-235	1E-08	—	2E-08	1E-08
U-238	6E-08	—	9E-08	6E-08
$ELCR_{Sample}$[c]	7E-08	3E-04	5E-04	2E-04
$ELCR_{SampleDepth}$[d]	**3E-04**		**5E-04**	**2E-04**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] Slant depth is 11.5 ft.
[b] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[c] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[d] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-27. Radiological Risk Assessment Results for Exposure Area E under CERCLA Industrial Worker Scenario.

Borehole Name	**C7672**				
Sample ID	**B26C68**	**B26C70**	**B26C74**	**B26JK2**	**B26JK3**
Top (feet)	**5**	**10**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**				
Cs-137	—	—	—	3E-05	—
Se-79	7E-10	2E-09	7E-10	9E-10	—
Sn-126	6E-05	4E-05	4E-05	2E-04	—
Sr-90	—	—	—	1E-07	—
U-233	3E-08	3E-08	3E-08	—	3E-08
U-234	2E-09	—	5E-09	—	3E-09
U-235	1E-08	1E-08	2E-08	—	2E-08
U-238	7E-08	6E-08	9E-08	—	8E-08
$ELCR_{Sample}$[b]	6E-05	4E-05	4E-05	2E-04	1E-07
$ELCR_{SampleDepth}$[c]	6E-05	4E-05	4E-05	**2E-04**	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-28. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Industrial Worker Scenario.

Borehole Name	**C7468**				**C7472**				
Sample ID	**B211Y3**	**B211Y6**	**B211Y9**	**B215L0**	**B236N5**	**B236N8**	**B236P2**	**B238H1**	**B23KT4**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**0**	**5**	**14**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**1**	**7**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**								
C-14	—	—	—	—	1E-10	—	—	2E-10	4E-10
Cs-137	—	—	—	3E-05	—	1E-05	—	—	—
Se-79	—	—	—	—	—	—	1E-09	—	—
Sn-126	—	—	—	—	3E-05	—	—	—	—
Sr-90	—	—	—	—	1E-08	—	—	1E-08	
U-233	2E-08	1E-08	1E-08	4E-08	2E-08	—	2E-08	2E-08	1E-08
U-234	—	2E-09	2E-09	3E-09	—	3E-09	4E-09	—	—
U-235	1E-08	9E-09	1E-08	2E-08	1E-08	—	2E-08	1E-08	1E-08
U-238	5E-08	4E-08	5E-08	9E-08	6E-08	—	1E-07	5E-08	5E-08
$ELCR_{Sample}$[b]	8E-08	7E-08	7E-08	3E-05	3E-05	1E-05	2E-07	1E-07	7E-08
$ELCR_{SampleDepth}$[c]	8E-08	7E-08	7E-08	3E-05	4E-05		2E-07	1E-07	7E-08

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-29. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Industrial Worker Scenario.

Borehole Name	**C7680**					**C7682**				
Sample ID	**B26C26**	**B26C28**	**B26C30**	**B26JK8**	**B26JK9**	**B26C47**	**B26C51**	**B26C53**	**B26JL0**	**B26JL1**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**12**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**14**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
C-14	—	—	—	—	—	1E-10	—	—	—	—
H-3	—	—	—	1E-07	—	—	4E-09	7E-09	—	4E-09
Se-79	9E-10	1E-09	—	—	—	—	—	—	—	—
Sn-126	7E-05	—	4E-05	—	7E-05	8E-05	3E-05	5E-05	—	1E-04
U-233	2E-08	1E-08	2E-08	2E-08	—	3E-08	2E-08	2E-08	3E-08	—
U-234	3E-09	3E-09	—	4E-09	—	—	—	—	—	—
U-235	1E-08	1E-08	1E-08	1E-08	—	1E-08	1E-08	1E-08	—	1E-08
U-238	6E-08	5E-08	6E-08	5E-08	—	5E-08	6E-08	6E-08	—	6E-08
$ELCR_{Sample}$[b]	7E-05	8E-08	4E-05	2E-07	7E-05	8E-05	3E-05	5E-05	3E-08	1E-04
$ELCR_{SampleDepth}$[c]	7E-05	8E-08	4E-05	7E-05		8E-05	3E-05	5E-05	1E-04	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-30. Radiological Risk Assessment Results for Exposure Area J under CERCLA Industrial Worker Scenario.

Borehole Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR[a]**			
C-14	—	4E-10	—	—
Cs-137	—	3E-05	—	—
Pu-238	—	1E-09	—	—
Pu-239/240	7E-10	—	—	—
Pu-241	2E-10	—	—	—
Se-79	—	5E-09	2E-09	2E-09
Sr-90	—	2E-07	—	—
U-235	2E-08	—	1E-08	1E-08
U-238	7E-08	—	6E-08	6E-08
$ELCR_{Sab}$[b]	9E-08	3E-05	8E-08	8E-08
$ELCR_{SampleDepth}$[c]	3E-05		8E-08	8E-08

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[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-31. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Industrial Worker Scenario.

Borehole Name	**C7466**					**C7670**				
Sample ID	**B20XW6**	**B20XW9**	**B20XX2**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23R25**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**0**	**0**	**10**	**14**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**1**	**1**	**14**	**16**
COPC	**COPC-Specific ELCR[a]**									
C-14	2E-09	—	—	1E-09	—	—	—	—	—	1E-10
Cs-137	2E-06	—	—	—	1E-05	—	—	4E-05	—	—
H-3	—	—	—	—	—	6E-09	—	—	—	—
Ni-63	—	—	—	—	—	—	3E-08	—	—	—
Se-79	—	7E-10	—	—	—	—	—	—	—	—
Sn-126	—	—	—	—	—	—	3E-05	—	—	9E-05
Sr-90	—	—	—	—	2E-07	6E-09	7E-08	—	—	—
U-233	2E-08	7E-09	1E-08	—	2E-08	2E-08	4E-08	—	3E-08	2E-08
U-234	2E-09	—	3E-09	3E-09	—	—	3E-09	—	—	2E-09
U-235	2E-08	7E-09	9E-09	—	1E-08	1E-08	2E-08	—	9E-09	1E-08
U-238	8E-08	4E-08	5E-08	—	6E-08	5E-08	1E-07	—	4E-08	5E-08
$ELCR_{Sample}$[b]	3E-06	5E-08	7E-08	4E-09	1E-05	9E-08	3E-05	4E-05	8E-08	9E-05
$ELCR_{SampleDepth}$[c]	3E-06	5E-08	7E-08	1E-05		9E-08	8E-05		8E-08	9E-05

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[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-32. Radiological Risk Assessment Results for Exposure Area P under CERCLA Industrial Worker Scenario.

Borehole Name	C6392	C6400		C6402			C6404		C6406		
Sample ID	**B1YT71**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW3**	**B1YT92**	**B1YT93**	**B1YTC9**	**B1YTD2**	**B1YTD5**
Top (feet)	**14**	**5**	**10**	**6**	**10**	**14**	**6**	**10**	**5**	**10**	**14**
Bottom (feet)	**16**	**7**	**12**	**8**	**12**	**16**	**8**	**12**	**7**	**12**	**16**
COPC	**COPC-Specific ELCR[a]**										
Am-241	2E-07	—	—	—	—	—	—	—	—	—	—
Co-60	9E-06	—	—	—	—	—	—	—	—	—	—
Cs-137	4E-04	5E-06	2E-06	2E-04	1E-04	8E-05	2E-04	—	—	—	—
H-3	—	—	4E-07	—	—	—	—	—	—	—	—
I-129	—	4E-08	—	—	—	—	—	—	—	—	—
Ni-63	—	—	8E-09	—	—	—	—	—	—	—	—
Np-237	3E-06	—	—	—	—	—	—	—	—	—	—
Pu-239/240	2E-07	—	—	—	—	—	—	—	—	—	—
Pu-241	6E-08	—	—	—	—	—	—	—	—	—	—
Se-79	1E-09	1E-09	2E-09	4E-09	8E-10	2E-09	—	—	—	—	8E-10
Sr-90	6E-06	1E-07	—	4E-06	3E-06	4E-06	3E-06	7E-06	6E-07	—	—
Tc-99	6E-09	—	—	—	—	—	—	—	—	—	—
U-233	2E-08	1E-08	3E-08	3E-08	3E-08	4E-08	2E-08	—	2E-08	4E-08	2E-08
U-234	7E-09	6E-09	1E-08	3E-09	6E-09	4E-09	—	—	4E-09	2E-09	3E-09
U-235	4E-08	3E-08	7E-08	2E-08	4E-08	2E-08	1E-08	—	2E-08	2E-08	2E-08
U-238	2E-07	1E-07	3E-07	1E-07	2E-07	8E-08	6E-08	—	1E-07	1E-07	8E-08
$ELCR_{Sample}$[b]	4E-04	6E-06	3E-06	2E-04	1E-04	9E-05	2E-04	7E-06	8E-07	2E-07	1E-07
$ELCR_{SampleDepth}$[c]	**4E-04**	6E-06	3E-06	**2E-04**	**1E-04**	9E-05	**2E-04**	7E-06	8E-07	2E-07	1E-07

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-33. Radiological Risk Assessment Results for Exposure Area R under CERCLA Industrial Worker Scenario.

Borehole Name	**C7668**			
Sample ID	**B23TK2**	**B23TK5**	**B23TK8**	**B27130**
Top (feet)	**0**	**0**	**5**	**10**
Bottom (feet)	**1**	**1**	**7**	**14**
COPC	**COPC-Specific ELCR[a]**			
H-3	—	—	—	3E-09
Sr-90	—	2E-08	—	—
U-233	—	4E-08	4E-08	3E-08
U-234	2E-09	—	2E-09	—
U-235	1E-08	—	2E-08	1E-08
U-238	6E-08	—	7E-08	5E-08
$ELCR_{Sample}$[b]	8E-08	5E-08	1E-07	1E-07
$ELCR_{SampleDepth}$[c]	1E-07		1E-07	1E-07

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-34. Radiological Risk Assessment Results for Exposure Area U under CERCLA Industrial Worker Scenario.

Borehole Name	**C7676**			
Sample ID	**B26CC4**	**B26JK6**	**B26JK7**	**B29612**
Top (feet)	**10**	**0**	**0**	**5**
Bottom (feet)	**12**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR[a]**			
C-14	5E-11	—	—	—
Cs-137	—	1E-05	—	—
Np-237	—	1E-06	—	—
Se-79	—	—	—	1E-09
Sn-126	4E-05	5E-05	—	6E-05
Sr-90	—	—	2E-07	—
U-233	1E-08	—	3E-08	3E-08
U-234	2E-09	—	3E-09	3E-09
U-235	9E-09	—	1E-08	1E-08
U-238	4E-08	—	6E-08	7E-08
$ELCR_{Sample}$[b]	4E-05	6E-05	3E-07	6E-05
$ELCR_{SampleDepth}$[c]	4E-05	6E-05		6E-05

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-35. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Residential Receptor Scenario.

Borehole Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
Am-241	—	—	—	3E-08	—	—	—	2E-08	7E-08	—
C-14	—	5E-07	—	7E-07	—	—	3E-07	—	—	—
Cs-137	7E-05	—	—	—	—	—	—	—	4E-04	—
Pu-239/240	—	—	—	—	—	—	—	—	8E-08	—
Pu-241	—	—	—	—	—	—	—	—	9E-09	—
Se-79	—	—	—	—	—	—	—	4E-06	5E-06	—
Sn-126	9E-04	—	8E-04	6E-04	2E-03	5E-04	6E-04	9E-04	1E-03	—
Sr-90	—	4E-04	—	—	—	—	—	—	—	2E-04
U-234	—	4E-08	6E-08	6E-08	6E-08	—	4E-08	5E-08	8E-08	—
U-235	—	3E-08	4E-08	3E-08	3E-08	3E-08	3E-08	4E-08	—	5E-08
U-238	—	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	—	3E-07
$ELCR_{Sample}$[b]	1E-03	4E-04	8E-04	6E-04	2E-03	5E-04	6E-04	9E-04	1E-03	2E-04
$ELCR_{SampleDepth}$[c]	**1E-03**		**8E-04**	**6E-04**	**2E-03**	**5E-04**	**6E-04**	**9E-04**	**2E-03**	

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-36. Radiological Risk Assessment Results for Exposure Area C under CERCLA Residential Receptor Scenario.

Borehole Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4[a]**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR[b]**			
Cs-137	—	1E-04	—	—
Ni-63	—	—	1E-07	—
Sn-126	—	9E-04	2E-03	7E-04
Sr-90	—	4E-05	—	—
U-235	4E-08	—	6E-08	4E-08
U-238	2E-07	—	3E-07	2E-07
$ELCR_{Sample}$[c]	3E-07	1E-03	2E-03	7E-04
$ELCR_{SampleDepth}$[d]	**1E-03**		**2E-03**	**7E-04**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] Slant depth is 11.5 ft.
[b] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[c] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[d] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-37. Radiological Risk Assessment Results for Exposure Area E under CERCLA Residential Receptor Scenario.

Borehole Name	**C7672**				
Sample ID	**B26C68**	**B26C70**	**B26C74**	**B26JK2**	**B26JK3**
Top (feet)	**5**	**10**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**				
Cs-137	—	—	—	8E-05	—
Se-79	3E-06	7E-06	3E-06	4E-06	—
Sn-126	2E-04	1E-04	1E-04	6E-04	—
Sr-90	—	—	—	4E-05	—
U-233	5E-07	5E-07	4E-07	—	5E-07
U-234	5E-08	—	1E-07	—	6E-08
U-235	4E-08	4E-08	5E-08	—	5E-08
U-238	2E-07	2E-07	3E-07	—	3E-07
$ELCR_{Sample}$[b]	2E-04	1E-04	1E-04	8E-04	9E-07
$ELCR_{SampleDepth}$[c]	**2E-04**	**1E-04**	**1E-04**	**8E-04**	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-38. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Residential Receptor Scenario.

Borehole Name	**C7468**				**C7472**				
Sample ID	**B211Y3**	**B211Y6**	**B211Y9**	**B215L0**	**B236N5**	**B236N8**	**B236P2**	**B238H1**	**B23KT4**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**0**	**5**	**14**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**1**	**7**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**								
C-14	—	—	—	—	7E-07	—	—	1E-06	3E-06
Cs-137	—	—	—	8E-05	—	3E-05	—	—	—
Se-79	—	—	—	—	—	—	4E-06	—	—
Sn-126	—	—	—	—	9E-05	—	—	—	—
Sr-90	—	—	—	—	4E-06	—	—	4E-06	—
U-233	3E-07	2E-07	2E-07	6E-07	3E-07	—	4E-07	2E-07	2E-07
U-234	—	4E-08	4E-08	6E-08	—	7E-08	1E-07	—	—
U-235	3E-08	3E-08	3E-08	5E-08	3E-08	—	7E-08	3E-08	3E-08
U-238	2E-07	2E-07	2E-07	3E-07	2E-07	—	4E-07	2E-07	2E-07
$ELCR_{Sample}$[b]	5E-07	4E-07	4E-07	8E-05	9E-05	3E-05	5E-06	6E-06	3E-06
$ELCR_{SampleDepth}$[c]	5E-07	4E-07	4E-07	8E-05	**1E-04**		5E-06	6E-06	3E-06

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-39. Radiological Risk Assessment Results for Exposure Av H + I under CERCLA Residential Receptor Scenario.

Borehole Name	C7680					C7682				
Sample ID	**B26C26**	**B26C28**	**B26C30**	**B26JK8**	**B26JK9**	**B26C47**	**B26C51**	**B26C53**	**B26JL0**	**B26JL1**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**12**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**14**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
C-14	—	—	—	—	—	7E-07	—	—	—	—
H-3	—	—	—	3E-06	—	—	1E-07	2E-07	—	1E-07
Se-79	4E-06	5E-06	—	—	—	—	—	—	—	—
Sn-126	2E-04	—	1E-04	—	2E-04	3E-04	1E-04	2E-04	—	3E-04
U-233	4E-07	2E-07	4E-07	4E-07	—	5E-07	3E-07	3E-07	5E-07	—
U-234	6E-08	7E-08	—	8E-08	—	—	—	—	—	—
U-235	4E-08	3E-08	3E-08	3E-08	—	3E-08	3E-08	4E-08	—	4E-08
U-238	2E-07	2E-07	2E-07	2E-07	—	2E-07	2E-07	2E-07	—	2E-07
$ELCR_{Sample}$[b]	2E-04	5E-06	1E-04	3E-06	2E-04	3E-04	1E-04	2E-04	5E-07	3E-04
$ELCR_{SampleDepth}$[c]	**2E-04**	5E-06	**1E-04**	**3E-04**		**3E-04**	**1E-04**	**2E-04**	**3E-04**	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-40. Radiological Risk Assessment Results for Exposure Area J under CERCLA Residential Receptor Scenario.

Borehole Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR[a]**			
C-14	—	3E-06	—	—
Cs-137	—	9E-05	—	—
Pu-238	—	2E-08	—	—
Pu-239/240	1E-08	—	—	—
Pu-241	1E-09	—	—	—
Se-79	—	2E-05	7E-06	9E-06
Sr-90	—	6E-05	—	—
U-235	4E-08	—	4E-08	4E-08
U-238	3E-07	—	2E-07	2E-07
$ELCR_{Sab}$[b]	3E-07	2E-04	7E-06	9E-06
$ELCR_{SampleDepth}$[c]	**2E-04**		7E-06	9E-06

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-41. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Residential Receptor Scenario.

Borehole Name	**C7466**					**C7670**				
Sample ID	**B20XW6**	**B20XW9**	**B20XX2**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23R25**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**0**	**0**	**10**	**14**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**1**	**1**	**14**	**16**
COPC	**COPC-Specific ELCR[a]**									
C-14	1E-05	—	—	9E-06	—	—	—	—	—	1E-06
Cs-137	7E-06	—	—	—	4E-05	—	—	1E-04	—	—
H-3	—	—	—	—	—	2E-07	—	—	—	—
Ni-63	—	—	—	—	—	—	1E-05	—	—	—
Se-79	—	3E-06	—	—	—	—	—	—	—	—
Sn-126	—	—	—	—	—	—	1E-04	—	—	3E-04
Sr-90	—	—	—	—	6E-05	2E-06	2E-05	—	—	—
U-233	3E-07	1E-07	2E-07	—	3E-07	3E-07	5E-07	—	4E-07	2E-07
U-234	3E-08	—	6E-08	7E-08	—	—	6E-08	—	—	4E-08
U-235	5E-08	2E-08	3E-08	—	4E-08	3E-08	7E-08	—	3E-08	3E-08
U-238	3E-07	1E-07	2E-07	—	2E-07	2E-07	4E-07	—	2E-07	2E-07
$ELCR_{Sample}$[b]	2E-05	3E-06	4E-07	9E-06	1E-04	2E-06	2E-04	1E-04	6E-07	3E-04
$ELCR_{SampleDepth}$[c]	2E-05	3E-06	4E-07	**1E-04**		2E-06	**3E-04**		6E-07	**3E-04**

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-42. Radiological Risk Assessment Results for Exposure Area P under CERCLA Residential Receptor Scenario. (2 sheets)

Borehole Name	C6392	C6400		C6402			C6404		C6406		
Sample ID	B1YT71	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW3	B1YT92	B1YT93	B1YTC9	B1YTD2	B1YTD5
Top (feet)	14	5	10	6	10	14	6	10	5	10	14
Bottom (feet)	16	7	12	8	12	16	8	12	7	12	16
COPC	COPC-Specific ELCR[a]										
Am-241	9E-07	—	—	—	—	—	—	—	—	—	—
Co-60	2E-05	—	—	—	—	—	—	—	—	—	—
Cs-137	1E-03	2E-05	5E-06	5E-04	3E-04	2E-04	6E-04	—	—	—	—
H-3	—	—	1E-05	—	—	—	—	—	—	—	—
I-129	—	3E-06	—	—	—	—	—	—	—	—	—
Ni-63	—	—	3E-06	—	—	—	—	—	—	—	—
Np-237	1E-05	—	—	—	—	—	—	—	—	—	—
Pu-239/240	3E-06	—	—	—	—	—	—	—	—	—	—
Pu-241	3E-07	—	—	—	—	—	—	—	—	—	—
Se-79	4E-06	5E-06	8E-06	2E-05	4E-06	9E-06	—	—	—	—	4E-06
Sr-90	2E-03	3E-05	—	1E-03	1E-03	1E-03	8E-04	2E-03	2E-04	—	—
Tc-99	2E-04	—	—	—	—	—	—	—	—	—	—
U-233	3E-07	2E-07	4E-07	4E-07	5E-07	7E-07	3E-07	—	3E-07	6E-07	3E-07
U-234	2E-07	1E-07	3E-07	7E-08	1E-07	9E-08	—	—	1E-07	4E-08	7E-08
U-235	1E-07	9E-08	2E-07	6E-08	1E-07	5E-08	4E-08	—	7E-08	6E-08	4E-08
U-238	6E-07	5E-07	1E-06	4E-07	7E-07	3E-07	2E-07	—	4E-07	4E-07	3E-07

Table 3-42. Radiological Risk Assessment Results for Exposure Area P under CERCLA Residential Receptor Scenario. (2 sheets)

Borehole Name	C6392	C6400		C6402			C6404		C6406		
Sample ID	B1YT71	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW3	B1YT92	B1YT93	B1YTC9	B1YTD2	B1YTD5
COPC	COPC-Specific ELCR[a]										
$ELCR_{Sample}$[b]	3E-03	6E-05	3E-05	2E-03	1E-03	1E-03	1E-03	2E-03	2E-04	1E-06	4E-06
$ELCR_{SampleDepth}$[c]	**3E-03**	6E-05	3E-05	**2E-03**	**1E-03**	**1E-03**	**1E-03**	**2E-03**	**2E-04**	1E-06	4E-06

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

Table 3-43. Radiological Risk Assessment Results for Exposure Area R under CERCLA Residential Receptor Scenario.

Borehole Name	**C7668**			
Sample ID	**B23TK2**	**B23TK5**	**B23TK8**	**B27130**
Top (feet)	**0**	**0**	**5**	**10**
Bottom (feet)	**1**	**1**	**7**	**14**
COPC	**COPC-Specific ELCR[a]**			
H-3	—	—	—	9E-08
Sr-90	—	5E-06	—	—
U-233	—	6E-07	6E-07	5E-07
U-234	5E-08	—	5E-08	—
U-235	4E-08	—	5E-08	3E-08
U-238	2E-07	—	3E-07	2E-07
$ELCR_{Sample}$[b]	3E-07	6E-06	1E-06	8E-07
$ELCR_{SampleDepth}$[c]	6E-06		1E-06	8E-07

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

3.2.1.5 Comparison of Risk Characterization Results for Radiological Contaminants of Potential Concern Using Statistical and Sample-By-Sample Approach. Cancer risks based on the statistical sample approach were compared to the cancer risks based on the sample-by-sample approach for both the CERCLA industrial worker and CERCLA residential receptor scenarios. Table 3-45 presents the comparison of EA-specific radiological risk results for both receptors and sample approaches. ELCR values in bold are based on maximum soil concentration rather than EPCs based on the 95% UCL.

For the CERCLA industrial worker scenario, the ELCRs based on a statistical approach for eight of the EAs are either higher (more conservative) or equal to their corresponding ELCRs based on a sample-by-sample approach. For EA H+I and EA P, the ELCRs based on a sample-by-sample approach are more conservative than their corresponding ELCRs based on a statistical approach. For EA P, the calculated risks using both methods result in an unacceptable risk.

Table 3-44. Radiological Risk Assessment Results for Exposure Area U under CERCLA Residential Receptor Scenario.

Borehole Name	**C7676**			
Sample ID	**B26CC4**	**B26JK6**	**B26JK7**	**B29612**
Top (feet)	**10**	**0**	**0**	**5**
Bottom (feet)	**12**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR[a]**			
C-14	3E-07	—	—	—
Cs-137	—	3E-05	—	—
Np-237	—	5E-06	—	—
Se-79	—	—	—	5E-06
Sn-126	1E-04	2E-04	—	2E-04
Sr-90	—	—	6E-05	—
U-233	2E-07	—	5E-07	5E-07
U-234	5E-08	—	6E-08	8E-08
U-235	3E-08	—	3E-08	4E-08
U-238	1E-07	—	2E-07	2E-07
$ELCR_{Sample}$[b]	1E-04	2E-04	6E-05	2E-04
$ELCR_{SampleDepth}$[c]	**1E-04**	**3E-04**		**2E-04**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = COPC-Specific Risk to Source Ratio (1/pCi/g) × COPC-Specific Soil Concentration (pCi/g).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

Bold indicates exceedance of U.S. Environmental Protection Agency's risk threshold of 1E-04.

For the CERLCA residential scenario, the ELCRs based on a statistical approach are more conservative than the sample-by-sample approach for nine EAs. For EA P, the maximum sample-specific ELCR (3×10^{-3}) is more conservative than the ELCR (2×10^{-3}) based on EA-specific EPCs. It should be noted that risks from both methods result in unacceptable risk at EA P.

3.2.2 Nonradiological Human Health Risk Evaluations for the WAC Industrial Worker and WAC Residential Scenarios

Nonradiological risk evaluations were performed for the direct contact pathway using a sample-by-sample approach for both the WAC industrial worker and WAC residential receptor

scenarios. Cancer risks and non-cancer hazards were calculated for each depth interval within a borehole under the sample-by-sample approach. The exposure assumptions for both receptors and toxicity values for nonradiological contaminants are the same for both the statistical approach and sample-by-sample approach. However, the source-term concentrations and resulting risk characterization results are different.

Table 3-45. Comparison of Risk Evaluations Based on Statistical Sample Approach and Sample-By-Sample Approach.

Exposure Area	CERCLA Industrial Worker		CERCLA Residential Receptor	
	Statistical Approach	Sample-by-Sample Approach*	Statistical Approach	Sample-by-Sample Approach*
	ELCR	Range of ELCRs	ELCR	Range of ELCRs
A+B	5E-04	1E-4 to 5E-4	3E-03	5E-4 to 2E-3
C	**6E-04**	2E-4 to 5E-4	**3E-03**	7E-4 to 2E-3
E	**2E-04**	4E-5 to 2E-4	**1E-03**	1E-4 to 8E-4
F+G	4E-05	7E-8 to 4E-5	3E-04	4E-7 to 1E-4
H+I	8E-05	8E-8 to 1E-4	5E-04	5E-6 to 3E-4
J	**3E-05**	8E-8 to 3E-5	**5E-04**	7E-6 to 2E-4
L1+L2	1E-04	5E-8 to 9E-5	6E-04	6E-7 to 3E-4
P	2E-04	1E-7 to 4E-4	2E-03	1E-6 to 3E-3
R	**8E-07**	1E-7 to 1E-7	**7E-06**	8E-7 to 6E-6
U	**8E-05**	4E-5 to 6E-5	**5E-04**	1E-4 to 3E-4

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk

*The range of excess lifetime cancer risk represents the minimum and the maximum excess lifetime cancer risks within the different depth interval.
Note: ELCR values in **bold** are calculated from exposure point concentrations based on maximum soil concentration.

3.2.2.1 Identification and Determination of Nonradiological Source-term Concentrations for Contaminants of Potential Concern. Nonradiological risks are evaluated for each depth interval within a borehole. When only one sample was collected from a borehole, the detected concentrations for the contaminants in the sample were used as the source-term concentration. When multiple samples were collected from the same depth interval in a borehole (i.e., reflecting different sampling events), the maximum soil concentration for each detected contaminant was used as the source-term concentration at the specified depth interval. The source-term concentrations for each of the ten EAs within WMA C are summarized in Tables 3-46 through 3-55.

Table 3-46. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area A + B.

Well Name	C8102					C8104				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**Sample Concentration (µg/kg)**									
Aluminum	—	7,360,000	7,480,000	6,710,000	6,980,000	7,100,000	6,910,000	7,860,000	7,770,000	—
Antimony	—	211	231	252	269	123	114	168	342	—
Aroclor-1254	—	6.46	—	—	—	—	—	—	8.59	—
Arsenic	—	2,400	3,320	2,880	3,170	2,430	2,780	2,590	5,220	—
Barium	—	100,000	78,800	66,100	80,300	70,200	72,900	75,800	81,100	—
Cadmium	—	117	105	82.4	96.6	39.3	44	42	—	83.4
Chromium	—	7,840	7,440	8,440	5,970	7,830	10,100	11,100	8,990	—
Cobalt	—	8,380	6,540	6,470	9,200	6,910	7,100	6,650	11,400	—
Copper	11,500	—	11,100	10,800	12,800	12,500	11,400	11,800	14,200	—
Diethylphthalate	—	—	—	—	—	—	—	—	340	—
Fluoride	—	717	2,750	943	2,050	—	—	—	—	—
Iron	—	23,000,000	21,200,000	22,500,000	26,200,000	22,800,000	21,300,000	23,600,000	23,600,000	—
Lithium	—	7,820	8,540	7,640	7,100	7,760	8,250	8,640	—	8,170
Manganese	—	324,000	331,000	319,000	377,000	321,000	299,000	346,000	371,000	—
Nickel	10,300	—	7,530	12,200	8,280	9,520	8,220	11,800	9,840	—
Nitrate	—	3,900	16,100	4,640	8,830	—	—	5,270	1,710	—
Nitrite	—	1,080	848	342	361	—	—	—	—	—
Silver	—	52.5	45.1	46.4	52.5	31.5	28.6	29.2	46.1	—
Strontium	—	45,000	34,400	31,400	30,100	32,200	30,100	35,000	37,200	—
Tin	—	6,900	—	11,600	9,790	—	—	—	—	—
Vanadium	—	58,200	48,300	55,700	66,500	55,000	51,800	58,900	—	56,700
Zinc	—	44,500	41,200	41,400	47,500	42,100	41,600	46,900	45,600	—

COPC = contaminant of potential concern

Table 3-47. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**			
Aluminum	8,270,000	—	9,440,000	9,510,000
Antimony	—	283	721	175
Arsenic	—	6,700	21,200	3,810
Barium	81,500	—	85,300	98,800
Beryllium	323	—	403	355
Butylbenzylphthalate	—	81	—	—
Cadmium	—	109	150	95
Chromium	9,290	—	10,600	12,800
Cobalt	9,010	—	9,600	11,000
Copper	—	13,200	18,100	15,100
Fluoride	557	—	2,040	2,290
Iron	22,800,000	—	23,700,000	28,600,000
Lithium	—	8,740	12,100	7,800
Manganese	373,000	—	408,000	449,000
Mercury	—	5.06	—	3.9
Nickel	13,000	—	10,800	11,900
Nitrate	—	4,210	17,400	10,600
Nitrite	2,050	—	2,110	1,180
Silver	45.9	—	80	40
Strontium	—	33,100	44,700	36,700
Vanadium	—	49,000	52,400	78,500
Zinc	44,600	—	51,100	44,800

Table 3-48. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area E. (2 sheets)

Well Name	C7672								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**Sample Concentration (µg/kg)**								
Acetone	—	4.14	—	6.63	—	4.83	—	—	—
Aldrin	—	—	2	—	—	—	—	—	—
Aluminum	7,170,000	—	7,420,000	—	6,810,000	—	—	7,080,000	—
Antimony	157	—	92.6	—	164	—	178	—	—
Arsenic	5,070	—	3,390	—	2,990	—	—	5,200	—
Barium	75,000	—	76,400	—	78,400	—	—	76,600	—
Beryllium	159	—	158	—	147	—	158	—	—
Boron	—	—	3250	—	—	—	—	3340	—
Butylbenzylphthalate	123	—	—	—	121	—	124	—	—
Cadmium	2,700	—	2,870	—	3,180	—	—	3,260	—
Chromium	10,400	—	17,200	—	11,900	—	—	7,980	—
Cobalt	8,120	—	7,990	—	7,620	—	—	8,820	—
Copper	12,700	—	16,500	—	12,000	—	—	12,900	—
Fluoride	1,410	—	1,480	—	1,230	—	—	995	—
Iron	22,400,000	—	22,100,000	—	21,600,000	—	—	24,200,000	—
Lithium	7,420	—	7,730	—	7,030	—	9,130	—	—
Manganese	332,000	—	331,000	—	298,000	—	495,000	—	—

Table 3-48. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area E. (2 sheets)

Well Name	C7672								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Mercury	—	—	—	—	—	—	—	23.2	—
Nickel	7,820	—	12,400	—	11,100	—	9,550	—	—
Nitrate	4,060	—	2,850	—	3,720	—	—	5,020	—
Nitrite	1,030	—	1,400	—	724	—	—	1,060	—
Selenium	343	—	210	—	305	—	560	—	—
Silver	75	—	66.7	—	74.1	—	—	85	—
Strontium	31,800	—	34,700	—	30,100	—	—	28,900	—
Toluene	—	0.24	—	0.34	—	0.28	—	—	0.23
Vanadium	53,100	—	54,600	—	50,000	—	—	58,800	—
Zinc	41,900	—	39,800	—	42,200	—	—	44,800	—

COPC = contaminant of potential concern

Table 3-49. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area F + G.

Well Name	C7468										C7472							
Sample ID	B211Y3	B211Y5	B211Y6	B211Y8	B211Y9	B21201	B21221	B21222	B215L0	B215L1	B236N5	B236N8	B236P2	B236P4	B236P7	B238H1	B238H3	B23KT4
Top (feet)	5	5	10	10	14	14	0	0	0	0	0	0	5	5	10	14	14	10
Bottom (feet)	7	7	12	12	16	16	1	1	1	1	1	1	7	7	12	16	16	14
Contaminant of Potential Concern	Sample Concentration (µg/kg)																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.5	—	2.47	—
Aluminum	6,030,000	—	5,190,000	—	4,480,000	—	—	—	—	7,000,000	6,460,000	—	6,500,000	—	—	7,440,000	—	5,860,000
Antimony	—	—	—	—	—	—	—	—	182	—	245	—	262	—	—	120	—	—
Aroclor-1260	—	—	20.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	3,480	—	2,070	—	1,920	—	—	—	3,410	—	3,420	—	4,300	—	—	2,300	—	2,460
Barium	68,700	—	40,600	—	75,400	—	—	—	—	129,000	64,300	—	71,900	—	—	89,800	—	78,000
Beryllium	—	—	—	—	—	—	—	—	298	—	211	—	185	—	—	—	—	—
beta-BHC	25.3	—	21.3	—	23.2	—	—	—	25.2	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	1,790	—	2,840	—	7,420	—	—	—	—	—	—	—	—	—	—	—	—	667
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	48.8	—	—	72.6	—	—
Cadmium	119	—	—	—	—	—	—	—	143	—	90.2	—	116	—	—	73.3	—	74.5
Chromium	8,230	—	9,500	—	4,740	—	—	—	—	8,190	6,480	—	9,120	—	—	9,720	—	6,390
Cobalt	6,610	—	5,360	—	7,760	—	—	—	8,760	—	8,740	—	6,040	—	—	6,850	—	8,420
Copper	11,400	—	10,700	—	10,100	—	—	—	—	11,000	12,800	—	12,200	—	—	11,200	—	15,600
Fluoride	1,220	—	695	—	1,090	—	—	—	—	1,070	—	832	3,290	—	—	1,650	—	1,740
Gamma-BHC (Lindane)	—	—	—	—	5.1	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	17,300,000	—	15,200,000	—	23,900,000	—	—	—	24,400,000	—	21,500,000	—	16,500,000	—	—	24,400,000	—	25,900,000
Lithium	7,690	—	6,660	—	3,350	—	—	—	—	7,800	6,090	—	7,910	—	—	6,610	—	4,370
Manganese	259,000	—	229,000	—	302,000	—	—	—	—	500,000	316,000	—	286,000	—	—	384,000	—	358,000
Mercury	—	—	—	—	—	—	—	—	—	—	30.4	—	—	—	—	—	—	—
Methylene chloride	—	2	—	2	—	—	—	2	—	—	—	—	—	—	—	—	—	—
Nickel	9,050	—	9,010	—	6,400	—	—	—	—	12,400	11,900	—	11,700	—	—	10,400	—	7,510
Nitrate	4,680	—	3,250	—	4,750	—	—	—	—	5,340	4,670	—	11,400	—	—	4,090	—	4,470
Nitrite	3,010	—	2,110	—	1,470	—	—	—	—	4,080	2,340	—	1,580	—	—	1,180	—	3,300
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	70.7	—	81.8
Strontium	24,900	—	25,700	—	21,700	—	—	—	—	30,700	28,400	—	49,700	—	—	34,800	—	26,500
Styrene	—	0.65	—	0.25	—	0.25	—	0.31	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	6360	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	0.98	0.25	—	0.24	—
Vanadium	47,200	—	40,900	—	78,500	—	—	—	—	68,500	41,800	—	31,600	—	—	70,700	—	78,200
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.463	—	—	—	—
Zinc	35,500	—	28,500	—	34,900	—	—	—	—	43,100	38,200	—	33,400	—	—	33,400	—	37,000

Table 3-50. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area H + I.

Well Name	C7680								C7682								
Sample ID	B26C26	B26C27	B26C28	B26C30	B26C31	B26JK8	B26JK9	B26JL8	B26C47	B26C48	B26C50	B26C51	B26C53	B26C54	B26JL0	B26JL1	B26JM0
Top (feet)	5	5	10	14	14	0	0	0	5	5	10	12	14	14	0	0	0
Bottom (feet)	7	7	12	16	16	1	1	1	7	7	12	14	16	16	1	1	1
Contaminant of Potential Concern	Sample Concentration (µg/kg)																
Aluminum	7,730,000	—	4,590,000	6,930,000	—	7,310,000	—	—	5,640,000	—	—	6,030,000	6,380,000	—	—	6,100,000	—
Antimony	202	—	77.9	111	—	214	—	—	420	—	—	110	89.7	—	—	218	—
Arsenic	3,670	—	3,030	2,950	—	4,920	—	—	5,000	—	—	3,000	2,000	—	—	7,000	—
Barium	80,600	—	75,900	89,700	—	77,700	—	—	71,000	—	—	89,600	103,000	—	—	82,200	—
Beryllium	199	—	—	136	—	190	—	—	204	—	—	159	190	—	—	212	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	200	—	—	—	—
Cadmium	87.7	—	70.2	66.1	—	84.8	—	—	196	—	—	136	127	—	100	—	—
Chromium	10,100	—	5,340	26,800	—	9,090	—	—	7,710	—	—	10,100	14,900	—	—	7,550	—
Cobalt	7,990	—	11,300	10,300	—	8,140	—	—	6,680	—	—	9,840	10,600	—	—	7,850	—
Copper	9,970	—	13,500	11,200	—	11,300	—	—	11,900	—	—	11,300	11,300	—	—	11,800	—
Di-n-butylphthalate	—	—	—	—	—	—	570	—	—	—	—	—	—	—	—	—	—
Fluoride	1,070	—	372	1,500	—	846	—	—	1,600	—	—	1,450	1,490	—	—	2,100	—
Iron	22,200,000	—	31,200,000	26,800,000	—	22,300,000	—	—	14,300,000	—	—	22,800,000	24,000,000	—	—	16,300,000	—
Lithium	7,230	—	3,560	6,800	—	7,810	—	—	6,570	—	—	5,990	7,040	—	—	8,010	—
Manganese	346,000	—	387,000	424,000	—	332,000	—	—	270,000	—	—	383,000	465,000	—	—	332,000	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	1,980	2,000	—	—	—	—
Nickel	8,650	—	6,610	18,300	—	11,100	—	—	8,930	—	—	10,400	12,300	—	—	9,610	—
Nitrate	11,200	—	2,750	7,740	—	—	11,500	—	23,800	—	—	12,200	12,800	—	—	54,600	—
Nitrite	736	—	613	1,120	—	232	—	—		—	—	1,850	1,340	—	—	1,210	—
Selenium	523	—	965	602	—	615	—	—	1000	—	—	1,000	1,000	—	—	1,000	—
Silver	62.4	—	59.1	61.8	—	66.7	—	—	—	—	—	—	—	—	—	—	—
Strontium	23,700	—	20,200	35,100	—	32,600	—	—	21,500	—	—	31,100	37,700	—	—	30,500	—
Styrene	—	0.33	—	—	0.27	—	—	0.31	—	0.33	0.36	—	—	0.46	—	—	0.43
Toluene	—	0.39	—	—	0.60	—	—	0.27	—	0.31	0.35	—	—	1.05	—	—	0.39
Vanadium	52,300	—	82,600	75,100	—	53,400	—	—	24,500	—	—	52,300	53,800	—	—	27,000	—
Zinc	42,400	—	53,000	42,800	—	43,000	—	—	29,500	—	—	36,100	38,100	—	—	36,400	—

Table 3-51. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area J.

Well Name	C8100			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**			
Aluminum	7,740,000	—	6,890,000	6,910,000
Antimony	219	—	233	2,160
Arsenic	3,270	—	5,290	7,890
Barium	244,000	—	79,500	77,800
Beryllium	328	—	160	134
Bis(2-ethylhexyl) phthalate	—	—	—	2,070
Boron	43,900	—	5,610	6,970
Butylbenzylphthalate	—	—	—	77.8
Cadmium	102	—	113	84
Chromium	10,500	—	11,600	9,580
Cobalt	6,340	—	6,950	8,270
Copper	—	12,100	12,200	13,800
Fluoride	502	—	1,040	1,530
Iron	18,700,000	—	21,600,000	24,100,000
Lithium	8,680	—	7,460	7,300
Manganese	—	287,000	340,000	383,000
Mercury	—	16.2	—	11.5
Nickel	13,700	—	10,200	10,700
Nitrate	3,240	—	9,230	8,920
Nitrite	—	1,550	2,500	1,220
Silver	62.4	—	57.7	58.8
Strontium	125,000	—	33,100	33,800
Tin	3,030	—	3,600	—
Vanadium	41,900	—	47,700	54,300
Zinc	34,300	—	43,400	52,300

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Table 3-52. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area L1 + L2.

Well Name	C7466									C7670						
Sample ID	B20XW6	B20XW8	B20XW9	B20XX1	B20XX2	B20XX4	B211X9	B215K8	B215K9	B238J9	B23KN7	B23KN9	B23R25	B23KP2	B25CN2	B23KP6
Top (feet)	5	5	10	10	14	14	0	0	0	5	0	0	0	10	10	14
Bottom (feet)	7	7	12	12	16	16	1	1	1	7	1	1	1	12	14	16
Contaminant of Potential Concern	Sample Concentration (µg/kg)															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	22.2	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	46.2	—	—
Aluminum	—	—	5,410,000	—	5,110,000	—	—	—	7,070,000	5,590,000	6,710,000	—	—	—	5,250,000	5,370,000
Antimony	—	—	—	—	—	—	—	—	500	96.8	—	—	286	—	80	74.1
Arsenic	4,070	—	1,800	—	2,030	—	—	—	3,690	2,200	4,520	—	—	—	2,360	2,590
Barium	106,000	—	46,600	—	53,400	—	—	—	84,700	70,100	—	—	86,300	—	51,100	55,400
Beryllium	—	—	—	—	—	—	—	—	—	144	—	—	216	—	117	111
beta-BHC	19.4	—	19.6	—	22.4	—	—	—	23.4	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	1,840	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	53.6	—	—	—	59.2	—	—	—	—	—	—	—
Cadmium	104	—	32.3	—	60.3	—	—	—	120	61.1	—	—	101	—	72.5	54.6
Chromium	11,100	—	7,540	—	8,500	—	—	—	7,960	10,600	7,570	—	—	—	8,590	8,360
Cobalt	10,700	—	4,340	—	5,640	—	—	8,370	—	5,320	8,810	—	—	—	5,450	5,500
Copper	15,100	—	8,020	—	9,650	—	—	—	11,200	11,000	—	—	11,500	—	10,200	9,660
Fluoride	1,660	—	688	—	379	—	—	567	—	1,110	1,360	—	—	—	940	1,130
Iron	25,900,000	—	12,600,000	—	16,800,000	—	—	—	22,300,000	16,000,000	20,100,000	—	—	—	15,900,000	16,000,000
Lithium	7,440	—	6,820	—	5,550	—	—	—	6,640	6,320	—	—	7,280	—	6,500	6,850
Manganese	450,000	—	169,000	—	243,000	—	—	—	393,000	241,000	—	—	348,000	—	238,000	259,000
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10.2	17.1
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2450	2260
Nickel	13,100	—	7,330	—	8,060	—	—	—	18,400	10,600	11,500	—	—	—	8,180	7,700
Nitrate	12,000	—	3,640	—	1,920	—	—	—	6,000	5,870	—	—	4,080	—	3,990	3,690
Nitrite	2,540	—	5,180	—	—	—	—	1,930	—	2,420	—	—	—	—	1,790	1,250
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,350	—
Silver	102	—	52	—	65.9	—	—	—	91.3	—	—	—	—	—	—	—
Strontium	32,700	—	26,300	—	19,000	—	—	—	31,100	28,100	33,300	—	—	—	25,900	26,900
Vanadium	66,700	—	35,500	—	52,200	—	—	—	71,600	32,000	37,900	—	—	—	32,600	33,500
Zinc	43,400	—	24,200	—	29,100	—	—	—	42,200	28,300	36,800	—	—	—	29,300	33,700

Table 3-53. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area P.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	B1YT69	B1YT71	B1YTF8	B1YTF9	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW1	B20XW3	B20XW5	B1YT92	B1YTC7	B1YTC9	B1YTD0	B1YTD2	B1YTD3	B1YTD5
Top (feet)	14	14	10	5	5	10	6	10	10	14	14	6	5	5	10	10	14	14
Bottom (feet)	16	16	12	7	7	12	8	12	12	16	16	8	7	7	12	12	16	16
COPC	Sample Concentration (µg/kg)																	
Acetone	9.39	—	12.6	6.99	—	—	—	—	4.2	—	4.18	—	12.3	—	13.1	—	—	—
Aluminum	—	7,800,000	—	—	5,850,000	5,830,000	7,600,000	7,260,000	—	6,720,000	—	5,810,000	—	7,180,000	—	6,870,000	—	5,650,000
Antimony	—	184	—	—	—	—	174	—	—	—	—	—	—	—	—	367	—	—
Aroclor-1260	—	—	—	—	—	25.2	—	26.8	—	—	—	—	—	—	—	—	—	—
Arsenic	—	5,620	—	—	3,980	3,830	4,800	4,410	—	5,160	—	4,310	—	4,190	—	5,900	—	1,790
Barium	—	77,100	—	—	66,100	85,400	82,900	75,100	—	68,200	—	68,800	—	86,100	—	82,500	—	79,900
Beryllium	—	—	—	—	191	—	315	295	—	237	—	—	—	248	—	275	—	—
beta-BHC	—	—	—	—	25.8	22.5	21.2	—	—	—	—	—	—	—	—	—	—	22.5
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	804	—	—	—	2,300	—	—	—	—	—	—
Cadmium	—	125	—	—	112	145	128	106	—	105	—	88.5	—	99.1	—	108	—	76.8
Chromium	—	8,230	—	—	5,480	4,470	8,700	9,080	—	9,660	—	6,800	—	9,260	—	10,600	—	21,800
Cobalt	—	8,960	—	—	7,660	8,170	8,330	9,890	—	8,320	—	6,370	—	8,600	—	9,240	—	9,900
Copper	—	12,500	—	—	12,400	11,900	12,900	13,200	—	12,600	—	11,300	—	12,400	—	12,600	—	12,800
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	863	—	—	—	—	—	—
Fluoride	—	4,760	—	—	1,910	1,970	—	1,890	—	2,390	—	2,390	—	1,340	—	1,690	—	1,410
Iron	—	25,100,000	—	—	21,000,000	20,000,000	24,900,000	24,200,000	—	22,300,000	—	20,700,000	—	22,400,000	—	24,300,000	—	30,500,000
Lithium	—	8,300	—	—	6,300	5,630	9,420	8,470	—	8,450	—	6,740	—	8,460	—	8,230	—	4,190
Manganese	—	369,000	—	—	298,000	346,000	385,000	358,000	—	305,000	—	291,000	—	349,000	—	385,000	—	356,000
Mercury	—	—	—	—	19.2	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	1.14	—	0.795	—	2.61	—
Nickel	—	12,300	—	—	8,580	9,110	6,710	7,160	—	7,390	—	9,510	—	9,650	—	12,500	—	13,900
Nitrate	—	13,600	—	—	8,080	5,720	—	9,010	—	17,500	—	3,700	—	9,840	—	4,890	—	5,490
Nitrite	—	—	—	—	5,160	4,370	—	3,690	—	5,760	—	1,670	—	4,800	—	2,600	—	3,420
Silver	—	—	—	—	101	100	207	208	—	223	—	160	—	—	—	149	—	—
Strontium	—	32,300	—	—	26,600	27,200	30,300	29,500	—	28,000	—	26,300	—	39,100	—	37,300	—	27,400
Tin	—	—	—	—	—	—	—	—	—	—	—	9,200	—	7,750	—	7,970	—	14,400
Toluene	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	60,200	—	—	58,300	58,400	78,000	60,600	—	71,400	—	56,700	—	60,800	—	62,400	—	110,000
Zinc	—	48,600	—	—	39,500	305,000	43,900	44,300	—	42,500	—	39,900	—	40,900	—	42,700	—	44,000

COPC = contaminant of potential concern

Table 3-54. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area R.

Well Name	C7668							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**							
2-Hexanone	—	2.52	—	—	2.77	2.08	—	—
Acetone	—	—	—	—	—	2.53	6.4	—
Aluminum	—	—	7,700,000	8,390,000	—	—	—	6,770,000
Antimony	—	—	245	—	—	—	—	161
Arsenic	—	—	5,250	5,830	—	—	—	4,900
Barium	—	—	73,200	79,200	—	—	—	66,800
Beryllium	—	—	156	175	—	—	—	166
Butylbenzylphthalate	—	—	76.1	107	—	—	—	—
Cadmium	—	—	3,020	3,470	—	—	—	2,990
Chromium	—	—	9,250	11,200	—	—	—	10,000
Cobalt	—	—	10,500	10,500	—	—	—	8,370
Copper	—	—	13,500	14,800	—	—	—	11,000
Fluoride	—	—	964	2,690	—	—	—	3,530
Iron	—	—	25,800,000	25,900,000	—	—	—	22,100,000
Lithium	—	—	8,000	9,050	—	—	—	7,290
Manganese	—	—	386,000	409,000	—	—	—	331,000
Mercury	—	—	13.5	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	1.4	—
Nickel	—	—	11,000	10,900	—	—	—	8,690
Nitrate	—	—	6,710	9,210	—	—	—	39,700
Nitrite	—	—	5,310	387	—	—	—	—
Selenium	701	—	—	594	—	—	—	685
Silver	53	—	—	51.9	—	—	—	69.4
Strontium	—	—	31,000	37,300	—	—	—	29,900
Toluene	—	0.59	—	—	0.34	0.32	—	—
Vanadium	—	—	64,200	64,100	—	—	—	55,600
Zinc	—	—	47,800	48,600	—	—	—	45,300

Table 3-55. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern within Exposure Area U.

Well Name	C7676							
Sample ID	B26CC1	B26CC4	B26CC5	B26CC7	B26JK6	B26JK7	B26JL7	B29612
Top (feet)	5	10	10	14	0	0	0	5
Bottom (feet)	7	12	12	16	1	1	1	9
Contaminant of Potential Concern	Sample Concentration (µg/kg)							
Acetone	—	—	6.18	5.96	—	—	—	—
Aluminum	—	4,960,000	—	—	6,910,000	—	—	8,270,000
Antimony	—	151	—	—	229	—	—	291
Arsenic	—	3,000	—	—	—	4,000	—	7,000
Barium	—	48,100	—	—	96,900	—	—	83,600
Benzene	—	—	—	0.33	—	—	—	—
Beryllium	—	126	—	—	—	222	—	235
Boron	—	—	—	—	6,420	—	—	—
Chromium	—	8,510	—	—	7,460	—	—	10,000
Cobalt	—	5,540	—	—	8,510	—	—	8,730
Copper	—	9,080	—	—	—	11,500	—	13,200
Fluoride	—	2,020	—	—	402	—	—	1,810
Iron	—	15,500,000	—	—	20,900,000	—	—	23,100,000
Lithium	—	5,520	—	—	—	7,360	—	9,240
Manganese	—	226,000	—	—	304,000	—	—	364,000
Mercury	—	—	—	—	—	20.6	—	10.2
Molybdenum	—	—	—	—	2,380	—	—	2,530
Nickel	—	6,680	—	—	8,780	—	—	9,800
Nitrate	—	6,590	—	—	8,510	—	—	7,370
Nitrite	—	671	—	—	—	982	—	2,190
Selenium	—	1,000	—	—	—	1,000	—	2,000
Strontium	—	23,000	—	—	—	49,600	—	36,800
Styrene	—	—	—	—	—	—	0.38	—
Toluene	0.58	—	0.56	0.70	—	—	0.74	—
Vanadium	—	38,800	—	—	50,000	—	—	51,900
Zinc	—	28,500	—	—	40,900	—	—	45,300

3.2.2.2 Exposure Assumptions for the WAC Industrial Worker and WAC Residential Receptor Scenarios. The exposure assumptions for WAC industrial worker and residential receptor scenarios are presented in Sections 3.1.2.5.2 and 3.1.2.5.7, respectively.

3.2.2.3 Toxicity Assessments for Nonradiological Contaminants of Potential Concern. Nonradiological COPCs can have both carcinogenic and noncarcinogenic toxicity values. For consistency with Section 3.1.3.1, chemical-specific toxicity values for noncarcinogens and carcinogens presented within Appendix B, Table B-1 were utilized during the sample-by-sample risk evaluations.

3.2.2.4 Risk Characterization for Nonradiological Contaminants of Potential Concern. Since nonradiological COPCs can have both carcinogenic and noncarcinogenic toxicity values, both carcinogenic risk and non-cancer hazard evaluations were performed. The methodologies used to perform carcinogenic risk and non-cancer hazard evaluations are briefly described in this section.

Carcinogenic Risk Evaluation

The following outlines each step of the carcinogenic risk characterization process associated with nonradiological COPCs for the sample-by-sample approach:

1. **Calculation of Sample-Specific ELCR –** The ELCR for each nonradiological COPC is calculated using the following equation:

$$ELCR_{COPC} = \frac{Concentration_{COPC}}{CUL_{carcinogenic}} \times TR$$

Where:

$ELCR_{COPC}$	=	COPC-specific ELCR (unitless)
$Concentration_{COPC}$	=	COPC-specific source-term concentration (mg/kg)
$CUL_{carcinogenic}$	=	COPC-specific carcinogenic Cleanup Level (mg/kg)
TR	=	target cancer risk, 10^{-5} for MTCA Method C.

Table 7-1 of ECF-Hanford-10-0453, *Calculation of Standard Method C Direct Contact Soil Cleanup Levels for Industrial Land Use for the 100 Areas and 300 Area Remedial Investigation/ Feasibility Study Reports* and ECF-Hanford-10-0444, *Documentation of Standard Method B Soil Cleanup Levels for Unrestricted Land Use* summarize the WAC 173-340-745 Standard Method C Industrial Soil Direct Contact Cleanup Levels and the WAC 173-340-740 Standard Method B Soil Cleanup Levels for carcinogenic and noncarcinogenic nonradiological contaminants, respectively.

The sample-specific ELCR from exposure to multiple COPCs detected in a sample is calculated by using the following equation:

$$ELCR_{Sample} = \sum_{i}^{N} ELCR_i$$

Where:

$ELCR_{Sample}$ = Sample-specific ELCR
$ELCR_i$ = COPC-specific ELCR for the ith COPC
N = number of COPCs.

2. **Calculation of Depth-Specific ELCR for each Borehole –** Nonradiological ELCR for direct contact exposure was evaluated for each depth interval within a borehole as described below:

   - When only one sample was collected within a depth interval, the ELCR based on that sample depth ($ELCR_{SampleDepth}$) is equal to the sample-specific ELCR ($ELCR_{Sample}$)

   - When more than one sample was collected at the same depth interval within a borehole, the nonradiological ELCR ($ELCR_{Sample}$) results were summed together to calculate the ELCR for that depth interval ($ELCR_{SampleDepth}$).

<u>Non-Cancer Hazard Evaluation</u>

The following outlines each step of the non-cancer hazard assessment process associated with nonradiological COPCs:

1. **Calculation of Sample-Specific HI –** The HQ for each nonradiological COPC within a sample was first calculated using the following equation:

$$HQ = \frac{Concentration_{COPC}}{CUL_{Noncarcinogenic}} \times THQ$$

Where:

HQ = COPC-specific HQ (unitless)
$Concentration_{COPC}$ = COPC-specific source-term soil concentration (mg/kg)
$CUL_{Noncarcinogenic}$ = COPC-specific noncarcinogenic Clean Up Level (mg/kg)
THQ = target hazard quotient, 1 for MTCA Method B.

Table 7-1 of ECF-Hanford-10-0453 and ECF-Hanford-10-0444 summarize the WAC 173-340-745 Standard Method C Industrial Soil Direct Contact Cleanup Levels and the WAC 173-340-740 Standard Method B Soil Cleanup Levels for carcinogenic and noncarcinogenic nonradiological contaminants, respectively.

The HI reflecting the summed exposure to multiple COPCs detected in a sample was calculated by using the following equation:

$$HI = \sum_{i}^{N} HQ_i$$

Where:

HI = Hazard Index

HQ_i = COPC-specific HQ for the ith COPC
N = number of COPCs.

2. **Calculation of Depth-Specific HI for each Borehole –** Nonradiological HI for direct contact exposure was evaluated for each depth interval within a borehole as described below:

   - When only one sample was collected within a depth interval, the HI based on that sample depth ($HI_{SampleDepth}$) is equal to the sample specific HI (HI_{Sample})

   - When more than one sample was collected from the same depth interval within a borehole, the nonradiological HI (HI_{Sample}) results were summed together to calculate the HI for that depth interval ($HI_{SampleDepth}$).

The results of $ELCR_{SampleDepth}$ were compared to the 2013 MTCA cumulative risk threshold of 1×10^{-5}. The ELCR values exceeding the cumulative risk threshold require a risk management decision. Appendix G presents the results of RAs for nonradiological COPCs. The results of the carcinogenic RAs based on WAC industrial worker scenario for the ten EAs within WMA C are summarized in Tables 3-56 through 3-65. The results of the carcinogenic RAs based on WAC residential receptor scenario for the ten EAs within WMA C are summarized in Tables 3-66 through 3-75.

During the non-cancer hazard evaluation, the results of $HI_{SampleDepth}$ were compared with respect to the 2013 MTCA's acceptable target HI of 1. When an $HI_{SampleDepth}$ is greater than 1, the noncancer hazard is unacceptable.

Appendix G presents the results of non-cancer hazard evaluations for nonradiological COPCs. The results of the non-cancer hazard evaluation based on the WAC industrial worker scenario for the ten EAs within WMA C are summarized in Tables 3-76 through 3-85.

The results of the non-cancer hazard evaluation based on the WAC residential receptor scenario for the ten EAs within WMA C are summarized in Tables 3-86 through 3-95.

Table 3-56. Results of Carcinogenic Risk Assessment for Exposure Area A + B based on WAC Industrial Worker Scenario.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
Aroclor-1254	—	1E-09	—	—	—	—	—	—	1E-09	—
Arsenic	—	3E-07	4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	—
$ELCR_{Sample}$[b]	—	3E-07	4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	—
$ELCR_{SampleDepth}$[c,d]	3E-07		4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	

COPC = contaminant of potential concern
WAC = *Washington Administrative Code*
ELCR = excess lifetime cancer risk

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-57. Results of Carcinogenic Risk Assessment for Exposure Area C based on WAC Industrial Worker Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR[a]**			
Arsenic	—	8E-07	2E-06	4E-07
Butylbenzylphthalate	—	1E-11	—	—
$ELCR_{Sample}$[b]	—	8E-07	2E-06	4E-07
$ELCR_{SampleDepth}$[c,d]	8E-07		2E-06	4E-07

COPC = contaminant of potential concern
ELCR = excess lifetime cancer risk
WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-58. Results of Carcinogenic Risk Assessment for Exposure Area E based on WAC Industrial Worker Scenario.

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**								
Aldrin	—	—	3E-09	—	—	—	—	—	—
Arsenic	6E-07	—	4E-07	—	3E-07	—	—	6E-07	—
Butylbenzylphthalate	2E-11	—	—	—	2E-11	—	2E-11	—	—
$ELCR_{Sample}$[b]	6E-07	—	4E-07	—	3E-07	—	2E-11	6E-07	—
$ELCR_{SampleDepth}$[c,d]	6E-07		4E-07		3E-07		6E-07		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-59. Results of Carcinogenic Risk Assessment for Exposure Area F + G based on WAC Industrial Worker Scenario.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**																	
Aroclor-1260	—	—	3E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	4E-07	—	2E-07	—	2E-07	—	—	—	4E-07	—	4E-07	—	5E-07	—	—	3E-07	—	3E-07
beta-BHC	3E-09	—	3E-09	—	3E-09	—	—	—	3E-09	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	2E-09	—	3E-09	—	8E-09	—	—	—	—	—	—	—	—	—	—	—	—	7E-10
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	7E-12	—	—	1E-11	—	—
Gamma-BHC (Lindane)	—	—	—	—	4E-10	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	3E-13	—	3E-13	—	—	—	3E-13	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$[b]	4E-07	3E-13	2E-07	3E-13	2E-07	—	—	3E-13	4E-07	—	4E-07	—	5E-07	—	—	3E-07	—	3E-07
$ELCR_{SampleDepth}$[c,d]	4E-07		2E-07		2E-07		4E-07				4E-07		5E-07			3E-07		3E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-60. Results of Carcinogenic Risk Assessment for Exposure Area H + I based on WAC Industrial Worker Scenario.

Well Name	**C7680**								**C7682**								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**																
Arsenic	4E-07	—	3E-07	3E-07	—	6E-07	—	—	6E-07	—	—	3E-07	2E-07	—	—	8E-07	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-11	—	—	—	—
$ELCR_{Sample}$[b]	4E-07	—	3E-07	3E-07	—	6E-07	—	—	6E-07	—	—	3E-07	2E-07	—	—	8E-07	—
$ELCR_{SampleDepth}$[c,d]	4E-07		3E-07	3E-07		6E-07			6E-07		—	3E-07	2E-07		8E-07		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-61. Results of Carcinogenic Risk Assessment for Exposure Area J based on WAC Industrial Worker Scenario.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR[a]**			
Arsenic	4E-07	—	6E-07	9E-07
Bis(2-ethylhexyl) phthalate	—	—	—	2E-09
Butylbenzylphthalate	—	—	—	1E-11
$ELCR_{Sample}$[b]	4E-07	—	6E-07	9E-07
$ELCR_{SampleDepth}$[c,d]	4E-07		6E-07	9E-07

COPC = contaminant of potential concern
ELCR = excess lifetime cancer risk
WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

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Table 3-62. Results of Carcinogenic Risk Assessment for Exposure Area L1 + L2 based on WAC Industrial Worker Scenario.

Well Name	**C7466**									**C7670**						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific ELCR[a]**															
Arsenic	5E-07	—	2E-07	—	2E-07	—	—	—	4E-07	3E-07	5E-07	—	—	—	3E-07	3E-07
beta-BHC	3E-09	—	3E-09	—	3E-09	—	—	—	3E-09	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	2E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	8E-12	—	—	—	9E-12	—	—	—	—	—	—	—
$ELCR_{Sample}$[b]	5E-07	—	2E-07	—	2E-07	—	—	—	4E-07	3E-07	5E-07	—	—	—	3E-07	3E-07
$ELCR_{SampleDepth}$[c,d]	5E-07		2E-07		2E-07		4E-07			3E-07	5E-07			—	3E-07	3E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample}$ = ∑ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth}$ = ∑ $ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-63. Results of Carcinogenic Risk Assessment for Exposure Area P based on WAC Industrial Worker Scenario.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific ELCR[a]**																	
Aroclor-1260	—	—	—	—	—	4E-09	—	4E-09	—	—	—	—	—	—	—	—	—	—
Arsenic	—	6E-07	—	—	5E-07	4E-07	5E-07	5E-07	—	6E-07	—	5E-07	—	5E-07	—	7E-07	—	2E-07
beta-BHC	—	—	—	—	4E-09	3E-09	3E-09	—	—	—	—	—	—	—	—	—	—	3E-09
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	9E-10	—	—	—	2E-09	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-13	—	1E-13	—	4E-13	—
$ELCR_{Sample}$[b]	—	6E-07	—	—	5E-07	4E-07	6E-07	5E-07	—	6E-07	—	5E-07	2E-13	5E-07	1E-13	7E-07	4E-13	2E-07
$ELCR_{SampleDepth}$[c,d]	6E-07		—	—		4E-07	6E-07	5E-07		6E-07		5E-07	5E-07		7E-07		2E-07	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-64. Results of Carcinogenic Risk Assessment for Exposure Area R based on WAC Industrial Worker Scenario.

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**							
Arsenic	—	—	6E-07	7E-07	—	—	—	6E-07
Butylbenzylphthalate	—	—	1E-11	2E-11	—	—	—	—
Methylene chloride	—	—	—	—	—	—	2E-13	—
$ELCR_{Sample}$[b]	—	—	6E-07	7E-07	—	—	2E-13	6E-07
$ELCR_{SampleDepth}$[c,d]	6E-07			7E-07			2E-13	6E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-65. Results of Carcinogenic Risk Assessment for Exposure Area U based on WAC Industrial Worker Scenario.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR[a]**							
Arsenic	—	3E-07	—	—	—	5E-07	—	8E-07
Benzene	—	—	—	1E-12	—	—	—	—
$ELCR_{Sample}$[b]	—	3E-07	—	1E-12	—	5E-07	—	8E-07
$ELCR_{SampleDepth}$[c,d]	**—**	3E-07		1E-12	5E-07			8E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-66. Results of Carcinogenic Risk Assessment for Exposure Area A + B based on WAC Residential Scenario.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (ft)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (ft)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**									
Aroclor-1254	—	1E-08	—	—	—	—	—	—	2E-08	—
Arsenic	—	4E-06	5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	—
$ELCR_{Sample}$[b]	—	4E-06	5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	—
$ELCR_{SampleDepth}$[c,d]	4E-06		5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-67. Results of Carcinogenic Risk Assessment for Exposure Area C based on WAC Residential Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR[a]**			
Arsenic	—	1E-05	3E-05	6E-06
Butylbenzylphthalate	—	2E-10	—	—
$ELCR_{Sample}$[b]	—	1E-05	3E-05	6E-06
$ELCR_{SampleDepth}$[c,d]	**1E-05**		**3E-05**	6E-06

COPC = contaminant of potential concern
ELCR = excess lifetime cancer risk
WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-68. Results of Carcinogenic Risk Assessment for Exposure Area E based on WAC Residential Scenario.

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**								
Aldrin	—	—	3E-08	—	—	—	—	—	—
Arsenic	8E-06	—	5E-06	—	4E-06	—	—	8E-06	—
Butylbenzylphthalate	2E-10	—	—	—	2E-10	—	2E-10	—	—
$ELCR_{Sample}$[b]	8E-06	—	5E-06	—	4E-06	—	2E-10	8E-06	—
$ELCR_{SampleDepth}$[c,d]	8E-06		5E-06		4E-06		8E-06		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

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Table 3-69. Results of Carcinogenic Risk Assessment for Exposure Area F + G based on WAC Residential Scenario.

Well Name	**C7468**										**C7472**							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**																	
Aroclor-1260	—	—	4E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	5E-06	—	3E-06	—	3E-06	—	—	—	5E-06	—	5E-06	—	6E-06	—	—	3E-06	—	4E-06
beta-BHC	5E-08	—	4E-08	—	4E-08	—	—	—	5E-08	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-08	—	4E-08	—	1E-07	—	—	—	—	—	—	—	—	—	—	—	—	9E-09
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	9E-11	—	—	1E-10	—	—
Gamma-BHC (Lindane)	—	—	—	—	6E-09	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	4E-12	—	4E-12	—	—	—	4E-12	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$[b]	5E-06	4E-12	3E-06	4E-12	3E-06	—	—	4E-12	5E-06	—	5E-06	—	6E-06	—	—	3E-06	—	4E-06
$ELCR_{SampleDepth}$[c,d]	5E-06		3E-06		3E-06		5E-06				5E-06		6E-06		—	3E-06		4E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample}$ = ∑ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth}$ = ∑ $ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-70. Results of Carcinogenic Risk Assessment for Exposure Area H + I based on WAC Residential Scenario.

Well Name	**C7680**								**C7682**								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR[a]**																
Arsenic	6E-06	—	5E-06	4E-06	—	7E-06	—	—	8E-06	—	—	5E-06	3E-06	—	—	1E-05	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	4E-10	—	—	—	—
$ELCR_{Sample}$[b]	6E-06	—	5E-06	4E-06	—	7E-06	—	—	8E-06	—	—	5E-06	3E-06	—	—	1E-05	—
$ELCR_{SampleDepth}$[c,d]	6E-06		5E-06	4E-06		7E-06			8E-06		—	5E-06	3E-06		**1E-05**		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-71. Results of Carcinogenic Risk Assessment for Exposure Area J based on WAC Residential Scenario.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR[a]**			
Arsenic	5E-06	—	8E-06	1E-05
Bis(2-ethylhexyl) phthalate	—	—	—	3E-08
Butylbenzylphthalate	—	—	—	1E-10
$ELCR_{Sample}$[b]	5E-06	—	8E-06	1E-05
$ELCR_{SampleDepth}$[c,d]	5E-06		8E-06	**1E-05**

COPC = contaminant of potential concern
ELCR = excess lifetime cancer risk
WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).
[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.
[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.
[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control At" cumulative cancer risk threshold of 1E-05.

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Table 3-72. Results of Carcinogenic Risk Assessment for Exposure Area L1 + L2 based on WAC Residential Scenario.

Well Name	**C7466**									**C7670**						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific ELCR[a]**															
Arsenic	6E-06	—	3E-06	—	3E-06	—	—	—	6E-06	3E-06	7E-06	—	—	—	4E-06	4E-06
beta-BHC	3E-08	—	4E-08	—	4E-08	—	—	—	4E-08	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	1E-10	—	—	—	1E-10	—	—	—	—	—	—	—
$ELCR_{Sample}$[b]	6E-06	—	3E-06	—	3E-06	—	—	—	6E-06	3E-06	7E-06	—	—	—	4E-06	4E-06
$ELCR_{SampleDepth}$[c,d]	6E-06		3E-06		3E-06		6E-06			3E-06	7E-06			—	4E-06	4E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-73. Results of Carcinogenic Risk Assessment for Exposure Area P based on WAC Residential Scenario.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific ELCR[a]**																	
Aroclor-1260	—	—	—	—	—	5E-08		5E-08	—	—	—	—	—	—	—	—	—	—
Arsenic	—	8E-06	—	—	6E-06	6E-06	7E-06	7E-06	—	8E-06	—	6E-06	—	6E-06	—	9E-06	—	3E-06
beta-BHC	—	—	—	—	5E-08	4E-08	4E-08	—	—	—	—	—	—	—	—	—	—	4E-08
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	1E-08	—	—	—	3E-08	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-12	—	2E-12	—	5E-12	—
$ELCR_{Sample}$[b]	—	8E-06	—	—	6E-06	6E-06	7E-06	7E-06	—	8E-06	—	6E-06	2E-12	6E-06	2E-12	9E-06	5E-12	3E-06
$ELCR_{SampleDepth}$[c,d]	8E-06		—	—		6E-06	7E-06	7E-06		8E-06		6E-06	6E-06		9E-06		3E-06	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-74. Results of Carcinogenic Risk Assessment for Exposure Area R based on WAC Residential Scenario.

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific ELCR[a]**							
Arsenic	—	—	8E-06	9E-06	—	—	—	7E-06
Butylbenzylphthalate	—	—	1E-10	2E-10	—	—	—	—
Methylene chloride	—	—	—	—	—	—	3E-12	—
$ELCR_{Sample}$[b]	—	—	8E-06	9E-06	—	—	3E-12	7E-06
$ELCR_{SampleDepth}$[c,d]	8E-06			9E-06		—	3E-12	7E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-75. Results of Carcinogenic Risk Assessment for Exposure Area U based on WAC Residential Scenario.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR[a]**							
Arsenic	—	5E-06	—	—	—	6E-06	—	1E-05
Benzene	—	—	—	2E-11	—	—	—	—
$ELCR_{Sample}$[b]	—	5E-06	—	2E-11	—	6E-06	—	1E-05
$ELCR_{SampleDepth}$[c,d]	**—**	5E-06		2E-11	6E-06			**1E-05**

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk WAC = *Washington Administrative Code*

[a] COPC-Specific ELCR = (Soil Concentration (µg/kg) × 1E-05) / COPC-Specific Cleanup Level (µg/kg).

[b] $ELCR_{Sample} = \sum$ COPC-Specific ELCRs.

[c] $ELCR_{SampleDepth} = \sum ELCR_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" cumulative cancer risk threshold of 1E-05.

Table 3-76. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C8102					C8104				
Sample ID	B2B1L8	B2B1L9	B2D1X2	B2D1X4	B2D1X5	B2FB27	B2FB29	B2FB30	B2FPF1	B2FPF2
Top (feet)	0	0	5.7	11.5	16.1	5.7	11.5	16.1	0.5	0.5
Bottom (feet)	1	1	9.7	15.5	18.1	7.7	15.5	18.1	1	1
COPC	COPC-Specific Hazard Quotient[a]									
Aluminum	—	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	—
Antimony	—	2E-04	2E-04	2E-04	2E-04	9E-05	8E-05	1E-04	2E-04	—
Aroclor-1254	—	9E-05	—	—	—	—	—	—	1E-04	—
Arsenic	—	2E-03	3E-03	3E-03	3E-03	2E-03	3E-03	2E-03	5E-03	—
Barium	—	1E-04	1E-04	9E-05	1E-04	1E-04	1E-04	1E-04	1E-04	—
Cadmium	—	3E-05	3E-05	2E-05	3E-05	1E-05	1E-05	1E-05	—	2E-05
Chromium	—	1E-06	1E-06	2E-06	1E-06	1E-06	2E-06	2E-06	2E-06	—
Cobalt	—	8E-03	6E-03	6E-03	9E-03	7E-03	7E-03	6E-03	1E-02	—
Copper	8E-05	—	8E-05	8E-05	9E-05	9E-05	8E-05	8E-05	1E-04	—
Diethylphthalate	—	—	—	—	—	—	—	—	1E-07	—
Fluoride	—	3E-06	1E-05	4E-06	1E-05	—	—	—	—	—
Iron	—	9E-03	9E-03	9E-03	1E-02	9E-03	9E-03	1E-02	1E-02	—
Lithium	—	1E-03	1E-03	1E-03	1E-03	1E-03	1E-03	1E-03	—	1E-03
Manganese	—	7E-04	7E-04	7E-04	8E-04	7E-04	6E-04	7E-04	8E-04	—
Nickel	1E-04	—	1E-04	2E-04	1E-04	1E-04	1E-04	2E-04	1E-04	—
Nitrate	—	2E-07	6E-07	2E-07	4E-07	—	—	2E-07	7E-08	—
Nitrite	—	1E-06	8E-07	3E-07	3E-07	—	—	—	—	—

Table 3-76. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C8102					C8104				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**									
Silver	—	3E-06	3E-06	3E-06	3E-06	2E-06	2E-06	2E-06	3E-06	—
Strontium	—	2E-05	2E-05	1E-05	1E-05	2E-05	1E-05	2E-05	2E-05	—
Tin	—	3E-06	—	6E-06	5E-06	—	—	—	—	—
Vanadium	—	3E-03	3E-03	3E-03	4E-03	3E-03	3E-03	3E-03	—	3E-03
Zinc	—	4E-05	4E-05	4E-05	5E-05	4E-05	4E-05	4E-05	4E-05	—
HI_{Sample}[b]	2E-04	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	4E-03
$HI_{SampleDepth}$[c]	0.03		0.03	0.03	0.03	0.03	0.03	0.03	0.03	

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

Table 3-77. Results of Non-Cancer Hazard for Exposure Area C based on WAC Industrial Worker Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific Hazard Quotient[a]**			
Aluminum	2E-03	—	3E-03	3E-03
Antimony	—	2E-04	5E-04	1E-04
Arsenic	—	6E-03	2E-02	4E-03
Barium	1E-04	—	1E-04	1E-04
Beryllium	5E-05	—	6E-05	5E-05
Butylbenzylphthalate	—	1E-07	—	—
Cadmium	—	3E-05	4E-05	3E-05
Chromium	2E-06	—	2E-06	2E-06
Cobalt	9E-03	—	9E-03	1E-02
Copper	—	9E-05	1E-04	1E-04
Fluoride	3E-06	—	1E-05	1E-05
Iron	9E-03	—	1E-02	1E-02
Lithium	—	1E-03	2E-03	1E-03
Manganese	8E-04	—	8E-04	9E-04
Mercury	—	5E-06	—	4E-06
Nickel	2E-04	—	2E-04	2E-04
Nitrate	—	2E-07	7E-07	4E-07
Nitrite	2E-06	—	2E-06	1E-06
Silver	3E-06	—	5E-06	2E-06
Strontium	—	2E-05	2E-05	2E-05
Vanadium	—	3E-03	3E-03	4E-03
Zinc	4E-05	—	5E-05	4E-05
HI_{Sample}[b]	2E-02	1E-02	5E-02	4E-02
$HI_{SampleDepth}$[c]	0.03		0.05	0.04

COPC = contaminant of potential concern
HI = hazard index
WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).
[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.
[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

Table 3-78. Results of Non-Cancer Hazard for Exposure Area E based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C7672								
Sample ID	B26C68	B26C69	B26C70	B26C71	B26C74	B26C75	B26JK2	B26JK3	B26JL2
Top (feet)	5	5	10	10	14	14	0	0	0
Bottom (feet)	7	7	12	12	16	16	1	1	1
COPC	COPC-Specific Hazard Quotient[a]								
Acetone	—	1E-09	—	2E-09	—	2E-09	—	—	—
Aldrin	—	—	2E-05	—	—	—	—	—	—
Aluminum	2E-03	—	2E-03	—	2E-03	—	—	2E-03	—
Antimony	1E-04	—	7E-05	—	1E-04	—	1E-04	—	—
Arsenic	5E-03	—	3E-03	—	3E-03	—	—	5E-03	—
Barium	1E-04	—	1E-04	—	1E-04	—	—	1E-04	—
Beryllium	2E-05	—	2E-05	—	2E-05	—	2E-05	—	—
Boron	—	—	5E-06	—	—	—	—	5E-06	—
Butylbenzylphthalate	2E-07	—	—	—	2E-07	—	2E-07	—	—
Cadmium	8E-04	—	8E-04	—	9E-04	—	—	9E-04	—
Chromium	2E-06	—	3E-06	—	2E-06	—	—	2E-06	—
Cobalt	8E-03	—	8E-03	—	7E-03	—	—	8E-03	—
Copper	9E-05	—	1E-04	—	9E-05	—	—	9E-05	—
Fluoride	7E-06	—	7E-06	—	6E-06	—	—	5E-06	—
Iron	9E-03	—	9E-03	—	9E-03	—	—	1E-02	—
Lithium	1E-03	—	1E-03	—	1E-03	—	1E-03	—	—
Manganese	7E-04	—	7E-04	—	6E-04	—	1E-03	—	—

Table 3-78. Results of Non-Cancer Hazard for Exposure Area E based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C7672								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**								
Mercury	—	—	—	—	—	—	—	2E-05	—
Nickel	1E-04	—	2E-04	—	2E-04	—	1E-04	—	—
Nitrate	2E-07	—	1E-07	—	1E-07	—	—	2E-07	—
Nitrite	1E-06	—	1E-06	—	7E-07	—	—	1E-06	—
Selenium	2E-05	—	1E-05	—	2E-05	—	3E-05	—	—
Silver	4E-06	—	4E-06	—	4E-06	—	—	5E-06	—
Strontium	2E-05	—	2E-05	—	1E-05	—	—	1E-05	—
Toluene	—	8E-10	—	1E-09	—	1E-09	—	—	8E-10
Vanadium	3E-03	—	3E-03	—	3E-03	—	—	3E-03	—
Zinc	4E-05	—	4E-05	—	4E-05	—	—	4E-05	—
HI_{Sample}[b]	3E-02	2E-09	3E-02	3E-09	3E-02	3E-09	3E-03	3E-02	8E-10
$HI_{SampleDepth}$[c]	0.03		0.03		0.03		0.03		

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

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Table 3-79. Results of Non-Cancer Hazard for Exposure Area F + G based on WAC Industrial Worker Scenario.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient[a]**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-09	—	1E-09	—
Aluminum	2E-03	—	1E-03	—	1E-03	—	—	—	—	2E-03	2E-03	—	2E-03	—	—	2E-03	—	2E-03
Antimony	—	—	—	—	—	—	—	—	1E-04	—	2E-04	—	2E-04	—	—	9E-05	—	—
Arsenic	3E-03	—	2E-03	—	2E-03	—	—	—	3E-03	—	3E-03	—	4E-03	—	—	2E-03	—	2E-03
Barium	1E-04	—	6E-05	—	1E-04	—	—	—	—	2E-04	9E-05	—	1E-04	—	—	1E-04	—	1E-04
Beryllium	—	—	—	—	—	—	—	—	4E-05	—	3E-05	—	3E-05	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-05	—	4E-05	—	1E-04	—	—	—	—	—	—	—	—	—	—	—	—	1E-05
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	7E-08	—	—	1E-07	—	—
Cadmium	3E-05	—	—	—	—	—	—	—	4E-05	—	3E-05	—	3E-05	—	—	2E-05	—	2E-05
Chromium	2E-06	—	2E-06	—	9E-07	—	—	—	—	2E-06	1E-06	—	2E-06	—	—	2E-06	—	1E-06
Cobalt	6E-03	—	5E-03	—	7E-03	—	—	—	8E-03	—	8E-03	—	6E-03	—	—	7E-03	—	8E-03
Copper	8E-05	—	8E-05	—	7E-05	—	—	—	—	8E-05	9E-05	—	9E-05	—	—	8E-05	—	1E-04
Fluoride	6E-06	—	3E-06	—	5E-06	—	—	—	—	5E-06	—	4E-06	2E-05	—	—	8E-06	—	8E-06
Gamma-BHC (Lindane)	—	—	—	—	5E-06	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	7E-03	—	6E-03	—	1E-02	—	—	—	1E-02	—	9E-03	—	7E-03	—	—	1E-02	—	1E-02
Lithium	1E-03	—	1E-03	—	5E-04	—	—	—	—	1E-03	9E-04	—	1E-03	—	—	9E-04	—	6E-04
Manganese	5E-04	—	5E-04	—	6E-04	—	—	—	—	1E-03	6E-04	—	6E-04	—	—	8E-04	—	7E-04
Mercury	—	—	—	—	—	—	—	—	—	—	3E-05	—	—	—	—	—	—	—
Methylene chloride	—	1E-07	—	1E-07	—	—	—	1E-07	—	—	—	—	—	—	—	—	—	—
Nickel	1E-04	—	1E-04	—	9E-05	—	—	—	—	2E-04	2E-04	—	2E-04	—	—	1E-04	—	1E-04
Nitrate	2E-07	—	1E-07	—	2E-07	—	—	—	—	2E-07	2E-07	—	5E-07	—	—	2E-07	—	2E-07
Nitrite	3E-06	—	2E-06	—	1E-06	—	—	—	—	4E-06	2E-06	—	2E-06	—	—	1E-06	—	3E-06
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-10	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4E-06	—	5E-06
Strontium	1E-05	—	1E-05	—	1E-05	—	—	—	—	1E-05	1E-05	—	2E-05	—	—	2E-05	—	1E-05
Styrene	—	9E-10	—	4E-10	—	4E-10	—	4E-10	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	3E-06	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-09	9E-10	—	9E-10	—
Vanadium	3E-03	—	2E-03	—	4E-03	—	—	—	—	4E-03	2E-03	—	2E-03	—	—	4E-03	—	4E-03
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	7E-10	—	—	—	—
Zinc	3E-05	—	3E-05	—	3E-05	—	—	—	—	4E-05	4E-05	—	3E-05	—	—	3E-05	—	4E-05
HI_{Sample}[b]	2E-02	1E-07	2E-02	1E-07	3E-02	4E-10	0E+00	1E-07	2E-02	9E-03	3E-02	4E-06	2E-02	4E-09	2E-09	3E-02	2E-09	3E-02
$HI_{SampleDepth}$[c]	0.02		0.02		0.03		0.03				0.03		0.02		<0.01	0.03		0.03

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

Table 3-80. Results of Non-Cancer Hazard for Exposure Area H + I based on WAC Industrial Worker Scenario.

Well Name	C7680								C7682								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient[a]**																
Aluminum	2E-03	—	1E-03	2E-03	—	2E-03	—	—	2E-03	—	—	2E-03	2E-03	—	—	2E-03	—
Antimony	1E-04	—	6E-05	8E-05	—	2E-04	—	—	3E-04	—	—	8E-05	6E-05	—	—	2E-04	—
Arsenic	3E-03	—	3E-03	3E-03	—	5E-03	—	—	5E-03	—	—	3E-03	2E-03	—	—	7E-03	—
Barium	1E-04	—	1E-04	1E-04	—	1E-04	—	—	1E-04	—	—	1E-04	1E-04	—	—	1E-04	—
Beryllium	3E-05	—	—	2E-05	—	3E-05	—	—	3E-05	—	—	2E-05	3E-05	—	—	3E-05	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-07	—	—	—	—
Cadmium	3E-05	—	2E-05	2E-05	—	2E-05	—	—	6E-05	—	—	4E-05	4E-05	—	3E-05	—	—
Chromium	2E-06	—	1E-06	5E-06	—	2E-06	—	—	1E-06	—	—	2E-06	3E-06	—	—	1E-06	—
Cobalt	8E-03	—	1E-02	1E-02	—	8E-03	—	—	6E-03	—	—	9E-03	1E-02	—	—	7E-03	—
Copper	7E-05	—	1E-04	8E-05	—	8E-05	—	—	9E-05	—	—	8E-05	8E-05	—	—	8E-05	—
Di-n-butylphthalate	—	—	—	—	—	—	2E-06	—	—	—	—	—	—	—	—	—	—
Fluoride	5E-06	—	2E-06	7E-06	—	4E-06	—	—	8E-06	—	—	7E-06	7E-06	—	—	1E-05	—
Iron	9E-03	—	1E-02	1E-02	—	9E-03	—	—	6E-03	—	—	9E-03	1E-02	—	—	7E-03	—
Lithium	1E-03	—	5E-04	1E-03	—	1E-03	—	—	9E-04	—	—	9E-04	1E-03	—	—	1E-03	—
Manganese	7E-04	—	8E-04	9E-04	—	7E-04	—	—	6E-04	—	—	8E-04	9E-04	—	—	7E-04	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	1E-04	1E-04	—	—	—	—
Nickel	1E-04	—	9E-05	3E-04	—	2E-04	—	—	1E-04	—	—	1E-04	2E-04	—	—	1E-04	—
Nitrate	5E-07	—	1E-07	3E-07	—	—	5E-07	—	1E-06	—	—	5E-07	5E-07	—	—	2E-06	—
Nitrite	7E-07	—	6E-07	1E-06	—	2E-07	—	—	—	—	—	2E-06	1E-06	—	—	1E-06	—
Selenium	3E-05	—	6E-05	3E-05	—	4E-05	—	—	6E-05	—	—	6E-05	6E-05	—	—	6E-05	—
Silver	4E-06	—	3E-06	4E-06	—	4E-06	—	—	—	—	—	—	—	—	—	—	—
Strontium	1E-05	—	1E-05	2E-05	—	2E-05	—	—	1E-05	—	—	1E-05	2E-05	—	—	1E-05	—
Styrene	—	5E-10	—	—	4E-10	—	—	4E-10	—	5E-10	5E-10	—	—	7E-10	—	—	6E-10
Toluene	—	1E-09	—	—	2E-09	—	—	1E-09	—	1E-09	1E-09	—	—	4E-09	—	—	1E-09
Vanadium	3E-03	—	5E-03	4E-03	—	3E-03	—	—	1E-03	—	—	3E-03	3E-03	—	—	2E-03	—
Zinc	4E-05	—	5E-05	4E-05	—	4E-05	—	—	3E-05	—	—	3E-05	4E-05	—	—	3E-05	—
HI_{Sample}[b]	3E-02	2E-09	3E-02	3E-02	3E-09	3E-02	2E-06	1E-09	2E-02	2E-09	2E-09	3E-02	3E-02	4E-09	3E-05	3E-02	2E-09
$HI_{SampleDepth}$[c]	0.03		0.03	0.03		0.03			0.02		<0.01	0.03	0.03		0.03		

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

Table 3-81. Results of Non-Cancer Hazard for Exposure Area J based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C8100			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific Hazard Quotient[a]**			
Aluminum	2E-03	—	2E-03	2E-03
Antimony	2E-04	—	2E-04	2E-03
Arsenic	3E-03	—	5E-03	8E-03
Barium	3E-04	—	1E-04	1E-04
Beryllium	5E-05	—	2E-05	2E-05
Bis(2-ethylhexyl) phthalate	—	—	—	3E-05
Boron	6E-05	—	8E-06	1E-05
Butylbenzylphthalate	—	—	—	1E-07
Cadmium	3E-05	—	3E-05	2E-05
Chromium	2E-06	—	2E-06	2E-06
Cobalt	6E-03	—	7E-03	8E-03
Copper	—	9E-05	9E-05	1E-04
Fluoride	2E-06	—	5E-06	7E-06
Iron	8E-03	—	9E-03	1E-02
Lithium	1E-03	—	1E-03	1E-03
Manganese	—	6E-04	7E-04	8E-04
Mercury	—	2E-05	—	1E-05
Nickel	2E-04	—	1E-04	2E-04
Nitrate	1E-07	—	4E-07	4E-07
Nitrite	—	1E-06	2E-06	1E-06
Silver	4E-06	—	3E-06	3E-06
Strontium	6E-05	—	2E-05	2E-05
Tin	1E-06	—	2E-06	—
Vanadium	2E-03	—	3E-03	3E-03
Zinc	3E-05	—	4E-05	5E-05
HI_{Sample}[b]	2E-02	7E-04	3E-02	3E-02

Table 3-81. Results of Non-Cancer Hazard for Exposure Area J based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C8100			
Sample ID	B2B1L6	B2B1L7	B2C1M2	B2C1M3
COPC (continued)	COPC-Specific Hazard Quotient[a] (continued)			
$HI_{SampleDepth}$[c]	0.02		0.03	0.03

COPC = contaminant of potential concern
HI = hazard index
WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).
[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.
[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

Table 3-82. Results of Non-Cancer Hazard for Exposure Area L1 + L2 based on WAC Industrial Worker Scenario.

Well Name	C7466									C7670						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific Hazard Quotient[a]**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	6E-08	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-08	—	—
Aluminum	—	—	2E-03	—	1E-03	—	—	—	2E-03	2E-03	2E-03	—	—	—	2E-03	2E-03
Antimony	—	—	—	—	—	—	—	—	4E-04	7E-05	—	—	2E-04	—	6E-05	5E-05
Arsenic	4E-03	—	2E-03	—	2E-03	—	—	—	4E-03	2E-03	4E-03	—	—	—	2E-03	2E-03
Barium	2E-04	—	7E-05	—	8E-05	—	—	—	1E-04	1E-04	—	—	1E-04	—	7E-05	8E-05
Beryllium	—	—	—	—	—	—	—	—	—	2E-05	—	—	3E-05	—	2E-05	2E-05
Bis(2-ethylhexyl) phthalate	3E-05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	8E-08	—	—	—	8E-08	—	—	—	—	—	—	—
Cadmium	3E-05	—	9E-06	—	2E-05	—	—	—	3E-05	2E-05	—	—	3E-05	—	2E-05	2E-05
Chromium	2E-06	—	1E-06	—	2E-06	—	—	—	2E-06	2E-06	1E-06	—	—	—	2E-06	2E-06
Cobalt	1E-02	—	4E-03	—	5E-03	—	—	8E-03	—	5E-03	8E-03	—	—	—	5E-03	5E-03
Copper	1E-04	—	6E-05	—	7E-05	—	—	—	8E-05	8E-05	—	—	8E-05	—	7E-05	7E-05
Fluoride	8E-06	—	3E-06	—	2E-06	—	—	3E-06	—	5E-06	6E-06	—	—	—	4E-06	5E-06
Iron	1E-02	—	5E-03	—	7E-03	—	—	—	9E-03	7E-03	8E-03	—	—	—	6E-03	7E-03
Lithium	1E-03	—	1E-03	—	8E-04	—	—	—	9E-04	9E-04	—	—	1E-03	—	9E-04	1E-03
Manganese	9E-04	—	3E-04	—	5E-04	—	—	—	8E-04	5E-04	—	—	7E-04	—	5E-04	5E-04
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-05	2E-05
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-04	1E-04
Nickel	2E-04	—	1E-04	—	1E-04	—	—	—	3E-04	2E-04	2E-04	—	—	—	1E-04	1E-04
Nitrate	5E-07	—	1E-07	—	8E-08	—	—	—	2E-07	2E-07	—	—	2E-07	—	2E-07	1E-07
Nitrite	2E-06	—	5E-06	—	—	—	—	2E-06	—	2E-06	—	—	—	—	2E-06	1E-06
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8E-05	—
Silver	6E-06	—	3E-06	—	4E-06	—	—	—	5E-06	—	—	—	—	—	—	—
Strontium	2E-05	—	1E-05	—	9E-06	—	—	—	1E-05	1E-05	2E-05	—	—	—	1E-05	1E-05
Vanadium	4E-03	—	2E-03	—	3E-03	—	—	—	4E-03	2E-03	2E-03	—	—	—	2E-03	2E-03
Zinc	4E-05	—	2E-05	—	3E-05	—	—	—	4E-05	3E-05	4E-05	—	—	—	3E-05	3E-05
HI_{Sample}[b]	3E-02	—	2E-02	—	2E-02	—	—	8E-03	2E-02	2E-02	3E-02	6E-08	2E-03	1E-08	2E-02	2E-02
$HI_{SampleDepth}$[c]	0.03		0.02		0.02		0.03			0.02	0.03			<0.01	0.02	0.02

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

Table 3-83. Results of Non-Cancer Hazard for Exposure Area P based on WAC Industrial Worker Scenario.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	B1YT69	B1YT71	B1YTF8	B1YTF9	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW1	B20XW3	B20XW5	B1YT92	B1YTC7	B1YTC9	B1YTD0	B1YTD2	B1YTD3	B1YTD5
Top (feet)	14	14	10	5	5	10	6	10	10	14	14	6	5	5	10	10	14	14
Bottom (feet)	16	16	12	7	7	12	8	12	12	16	16	8	7	7	12	12	16	16
COPC	COPC-Specific Hazard Quotient[a]																	
Acetone	3E-09	—	4E-09	2E-09	—	—	—	—	1E-09	—	1E-09	—	4E-09	—	4E-09	—	—	—
Aluminum	—	2E-03	—	—	2E-03	2E-03	2E-03	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03
Antimony	—	1E-04	—	—	—	—	1E-04	—	—	—	—	—	—	—	—	3E-04	—	—
Arsenic	—	5E-03	—	—	4E-03	4E-03	5E-03	4E-03	—	5E-03	—	4E-03	—	4E-03	—	6E-03	—	2E-03
Barium	—	1E-04	—	—	9E-05	1E-04	1E-04	1E-04	—	1E-04	—	1E-04	—	1E-04	—	1E-04	—	1E-04
Beryllium	—	—	—	—	3E-05	—	5E-05	4E-05	—	3E-05	—	—	—	4E-05	—	4E-05	—	—
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	1E-05	—	—	—	3E-05	—	—	—	—	—	—
Cadmium	—	4E-05	—	—	3E-05	4E-05	4E-05	3E-05	—	3E-05	—	3E-05	—	3E-05	—	3E-05	—	2E-05
Chromium	—	2E-06	—	—	1E-06	9E-07	2E-06	2E-06	—	2E-06	—	1E-06	—	2E-06	—	2E-06	—	4E-06
Cobalt	—	9E-03	—	—	7E-03	8E-03	8E-03	9E-03	—	8E-03	—	6E-03	—	8E-03	—	9E-03	—	9E-03
Copper	—	9E-05	—	—	9E-05	9E-05	9E-05	9E-05	—	9E-05	—	8E-05	—	9E-05	—	9E-05	—	9E-05
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	2E-06	—	—	—	—	—	—
Fluoride	—	2E-05	—	—	9E-06	9E-06	—	9E-06	—	1E-05	—	1E-05	—	6E-06	—	8E-06	—	7E-06
Iron	—	1E-02	—	—	9E-03	8E-03	1E-02	1E-02	—	9E-03	—	8E-03	—	9E-03	—	1E-02	—	1E-02
Lithium	—	1E-03	—	—	9E-04	8E-04	1E-03	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03	—	6E-04
Manganese	—	8E-04	—	—	6E-04	7E-04	8E-04	7E-04	—	6E-04	—	6E-04	—	7E-04	—	8E-04	—	7E-04
Mercury	—	—	—	—	2E-05	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	5E-08	—	4E-08	—	1E-07	—
Nickel	—	2E-04	—	—	1E-04	1E-04	1E-04	1E-04	—	1E-04	—	1E-04	—	1E-04	—	2E-04	—	2E-04
Nitrate	—	5E-07	—	—	3E-07	2E-07	—	4E-07	—	7E-07	—	1E-07	—	4E-07	—	2E-07	—	2E-07
Nitrite	—	—	—	—	5E-06	4E-06	—	4E-06	—	5E-06	—	2E-06	—	5E-06	—	2E-06	—	3E-06
Silver	—	—	—	—	6E-06	6E-06	1E-05	1E-05	—	1E-05	—	9E-06	—	—	—	9E-06	—	—
Strontium	—	2E-05	—	—	1E-05	1E-05	1E-05	1E-05	—	1E-05	—	1E-05	—	2E-05	—	2E-05	—	1E-05
Tin	—	—	—	—	—	—	—	—	—	—	—	4E-06	—	4E-06	—	4E-06	—	7E-06
Toluene	1E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	3E-03	—	—	3E-03	3E-03	4E-03	3E-03	—	4E-03	—	3E-03	—	3E-03	—	4E-03	—	6E-03
Zinc	—	5E-05	—	—	4E-05	3E-04	4E-05	4E-05	—	4E-05	—	4E-05	—	4E-05	—	4E-05	—	4E-05
HI_{Sample}[b]	4E-09	3E-02	4E-09	2E-09	3E-02	3E-02	3E-02	3E-02	1E-09	3E-02	1E-09	3E-02	6E-08	3E-02	4E-08	3E-02	1E-07	3E-02
$HI_{SampleDepth}$[c]	0.03		<0.01	0.03		0.03	0.03	0.03		0.03		0.03	0.03		0.03		0.03	

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

Table 3-84. Results of Non-Cancer Hazard for Exposure Area R based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C7668							
Sample ID	B23TK2	B23TK4	B23TK5	B23TK8	B23TL0	B23TL6	B23TM2	B27130
Top (feet)	0	0	0	5	5	10	14	10
Bottom (feet)	1	1	1	7	7	12	16	14
COPC	COPC-Specific Hazard Quotient[a]							
2-Hexanone	—	1E-07	—	—	2E-07	1E-07	—	—
Acetone	—	—	—	—	—	8E-10	2E-09	—
Aluminum	—	—	2E-03	2E-03	—	—	—	2E-03
Antimony	—	—	2E-04	—	—	—	—	1E-04
Arsenic	—	—	5E-03	6E-03	—	—	—	5E-03
Barium	—	—	1E-04	1E-04	—	—	—	1E-04
Beryllium	—	—	2E-05	3E-05	—	—	—	2E-05
Butylbenzylphthalate	—	—	1E-07	2E-07	—	—	—	
Cadmium	—	—	9E-04	1E-03	—	—	—	9E-04
Chromium	—	—	2E-06	2E-06	—	—	—	2E-06
Cobalt	—	—	1E-02	1E-02	—	—	—	8E-03
Copper	—	—	1E-04	1E-04	—	—	—	8E-05
Fluoride	—	—	5E-06	1E-05	—	—	—	2E-05
Iron	—	—	1E-02	1E-02	—	—	—	9E-03
Lithium	—	—	1E-03	1E-03	—	—	—	1E-03
Manganese	—	—	8E-04	8E-04	—	—	—	7E-04
Mercury	—	—	1E-05	—	—	—	—	—

Table 3-84. Results of Non-Cancer Hazard for Exposure Area R based on WAC Industrial Worker Scenario. (2 sheets)

Well Name	C7668							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**							
Methylene chloride	—	—	—	—	—	—	7E-08	—
Nickel	—	—	2E-04	2E-04	—	—	—	1E-04
Nitrate	—	—	3E-07	4E-07	—	—	—	2E-06
Nitrite	—	—	5E-06	4E-07	—	—	—	—
Selenium	4E-05	—	—	3E-05	—	—	—	4E-05
Silver	3E-06	—	—	3E-06	—	—	—	4E-06
Strontium	—	—	1E-05	2E-05	—	—	—	1E-05
Toluene	—	2E-09	—	—	1E-09	1E-09	—	—
Vanadium	—	—	4E-03	4E-03	—	—	—	3E-03
Zinc	—	—	5E-05	5E-05	—	—	—	4E-05
HI_{Sample}[b]	4E-05	1E-07	3E-02	4E-02	2E-07	1E-07	7E-08	3E-02
$HI_{SampleDepth}$[c]	0.03			0.04		<0.01	<0.01	0.03

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

Table 3-85. Results of Non-Cancer Hazard for Exposure Area U based on WAC Industrial Worker Scenario.

Well Name	C7676							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific Hazard Quotient[a]**							
Acetone	—	—	2E-09	2E-09	—	—	—	—
Aluminum	—	1E-03	—	—	2E-03	—	—	2E-03
Antimony	—	1E-04	—	—	2E-04	—	—	2E-04
Arsenic	—	3E-03	—	—	—	4E-03	—	7E-03
Barium	—	7E-05	—	—	1E-04	—	—	1E-04
Benzene	—	—	—	2E-08	—	—	—	—
Beryllium	—	2E-05	—	—	—	3E-05	—	3E-05
Boron	—	—	—	—	9E-06	—	—	—
Chromium	—	2E-06	—	—	1E-06	—	—	2E-06
Cobalt	—	5E-03	—	—	8E-03	—	—	8E-03
Copper	—	6E-05	—	—	—	8E-05	—	9E-05
Fluoride	—	1E-05	—	—	2E-06	—	—	9E-06
Iron	—	6E-03	—	—	9E-03	—	—	9E-03
Lithium	—	8E-04	—	—	—	1E-03	—	1E-03
Manganese	—	5E-04	—	—	6E-04	—	—	7E-04
Mercury	—	—	—	—	—	2E-05	—	1E-05
Molybdenum	—	—	—	—	1E-04	—	—	1E-04
Nickel	—	1E-04	—	—	1E-04	—	—	1E-04
Nitrate	—	3E-07	—	—	3E-07	—	—	3E-07
Nitrite	—	6E-07	—	—	—	9E-07	—	2E-06
Selenium	—	6E-05	—	—	—	6E-05	—	1E-04
Strontium	—	1E-05	—	—	—	2E-05	—	2E-05
Styrene	—	—	—	—	—	—	5E-10	—
Toluene	2E-09	—	2E-09	3E-09	—	—	3E-09	—
Vanadium	—	2E-03	—	—	3E-03	—	—	3E-03
Zinc	—	3E-05	—	—	4E-05	—	—	4E-05
HI_{Sample}[b]	2E-09	2E-02	4E-09	3E-08	2E-02	5E-03	3E-09	3E-02
$HI_{SampleDepth}$[c]	<0.01	0.02		<0.01	0.03			0.03

COPC = contaminant of potential concern
HI = hazard index
WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).
[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.
[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

Table 3-86. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Residential Scenario. (2 sheets)

Well Name	C8102					C8104				
Sample ID	B2B1L8	B2B1L9	B2D1X2	B2D1X4	B2D1X5	B2FB27	B2FB29	B2FB30	B2FPF1	B2FPF2
Top (feet)	0	0	5.7	11.5	16.1	5.7	11.5	16.1	0.5	0.5
Bottom (feet)	1	1	9.7	15.5	18.1	7.7	15.5	18.1	1	1
COPC	COPC-Specific Hazard Quotient[a]									
Aluminum	—	9E-02	9E-02	8E-02	9E-02	9E-02	9E-02	1E-01	1E-01	—
Antimony	—	7E-03	7E-03	8E-03	8E-03	4E-03	4E-03	5E-03	1E-02	—
Aroclor-1254	—	4E-03	—	—	—	—	—	—	5E-03	—
Arsenic	—	1E-01	1E-01	1E-01	1E-01	1E-01	1E-01	1E-01	2E-01	—
Barium	—	6E-03	5E-03	4E-03	5E-03	4E-03	5E-03	5E-03	5E-03	—
Cadmium	—	1E-03	1E-03	1E-03	1E-03	5E-04	6E-04	5E-04	—	1E-03
Chromium	—	7E-05	6E-05	7E-05	5E-05	7E-05	8E-05	9E-05	7E-05	—
Cobalt	—	3E-01	3E-01	3E-01	4E-01	3E-01	3E-01	3E-01	5E-01	—
Copper	4E-03	—	3E-03	3E-03	4E-03	4E-03	4E-03	4E-03	4E-03	—
Diethylphthalate	—	—	—	—	—	—	—	—	5E-06	—
Fluoride	—	1E-04	6E-04	2E-04	4E-04	—	—	—	—	—
Iron	—	4E-01	4E-01	4E-01	5E-01	4E-01	4E-01	4E-01	4E-01	—
Lithium	—	5E-02	5E-02	5E-02	4E-02	5E-02	5E-02	5E-02	—	5E-02
Manganese	—	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	—
Nickel	6E-03	—	5E-03	8E-03	5E-03	6E-03	5E-03	7E-03	6E-03	—
Nitrate	—	7E-06	3E-05	8E-06	2E-05	—	—	9E-06	3E-06	—
Nitrite	—	5E-05	4E-05	1E-05	2E-05	—	—	—	—	—

Table 3-86. Results of Non-Cancer Hazard for Exposure Area A + B based on WAC Residential Scenario. (2 sheets)

Well Name	C8102					C8104				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**									
Silver	—	1E-04	1E-04	1E-04	1E-04	8E-05	7E-05	7E-05	1E-04	—
Strontium	—	9E-04	7E-04	7E-04	6E-04	7E-04	6E-04	7E-04	8E-04	—
Tin	—	1E-04	—	2E-04	2E-04	—	—	—	—	—
Vanadium	—	1E-01	1E-01	1E-01	2E-01	1E-01	1E-01	1E-01	—	1E-01
Zinc	—	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	—
HI_{Sample}[b]	1E-02	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	2E-01
$HI_{SampleDepth}$[c,d]	**1.2**		**1.1**	**1.1**	**1.3**	**1.1**	**1.1**	**1.2**	**1.5**	

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-87. Results of Non-Cancer Hazard for Exposure Area C based on WAC Residential Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific Hazard Quotient[a]**			
Aluminum	1E-01	—	1E-01	1E-01
Antimony	—	9E-03	2E-02	5E-03
Arsenic	—	3E-01	9E-01	2E-01
Barium	5E-03	—	5E-03	6E-03
Beryllium	2E-03	—	3E-03	2E-03
Butylbenzylphthalate	—	5E-06	—	—
Cadmium	—	1E-03	2E-03	1E-03
Chromium	8E-05	—	9E-05	1E-04
Cobalt	4E-01	—	4E-01	5E-01
Copper	—	4E-03	6E-03	5E-03
Fluoride	1E-04	—	4E-04	5E-04
Iron	4E-01	—	4E-01	5E-01
Lithium	—	5E-02	8E-02	5E-02
Manganese	3E-02	—	4E-02	4E-02
Mercury	—	2E-04	—	2E-04
Nickel	8E-03	—	7E-03	7E-03
Nitrate	—	7E-06	3E-05	2E-05
Nitrite	9E-05	—	9E-05	5E-05
Silver	1E-04	—	2E-04	1E-04
Strontium	—	7E-04	9E-04	8E-04
Vanadium	—	1E-01	1E-01	2E-01
Zinc	2E-03	—	2E-03	2E-03
HI_{Sample}[b]	9E-01	5E-01	2E+00	2E+00
$HI_{SampleDepth}$[c,d]	**1.4**		**2.1**	**1.6**

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-88. Results of Non-Cancer Hazard for Exposure Area E based on WAC Residential Scenario. (2 sheets)

Well Name	C7672								
Sample ID	B26C68	B26C69	B26C70	B26C71	B26C74	B26C75	B26JK2	B26JK3	B26JL2
Top (feet)	5	5	10	10	14	14	0	0	0
Bottom (feet)	7	7	12	12	16	16	1	1	1
COPC	COPC-Specific Hazard Quotient[a]								
Acetone	—	6E-08	—	9E-08	—	7E-08	—	—	—
Aldrin	—	—	8E-04	—	—	—	—	—	—
Aluminum	9E-02	—	9E-02	—	9E-02	—	—	9E-02	—
Antimony	5E-03	—	3E-03	—	5E-03	—	6E-03	—	—
Arsenic	2E-01	—	1E-01	—	1E-01	—	—	2E-01	—
Barium	5E-03	—	5E-03	—	5E-03	—	—	5E-03	—
Beryllium	1E-03	—	1E-03	—	9E-04	—	1E-03	—	—
Boron	—	—	2E-04	—	—	—	—	2E-04	—
Butylbenzylphthalate	8E-06	—	—	—	8E-06	—	8E-06	—	—
Cadmium	3E-02	—	4E-02	—	4E-02	—	—	4E-02	—
Chromium	9E-05	—	1E-04	—	1E-04	—	—	7E-05	—
Cobalt	3E-01	—	3E-01	—	3E-01	—	—	4E-01	—
Copper	4E-03	—	5E-03	—	4E-03	—	—	4E-03	—
Fluoride	3E-04	—	3E-04	—	3E-04	—	—	2E-04	—
Iron	4E-01	—	4E-01	—	4E-01	—	—	4E-01	—
Lithium	5E-02	—	5E-02	—	4E-02	—	6E-02	—	—
Manganese	3E-02	—	3E-02	—	3E-02	—	4E-02	—	—

Table 3-88. Results of Non-Cancer Hazard for Exposure Area E based on WAC Residential Scenario. (2 sheets)

Well Name	C7672								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**								
Mercury	—	—	—	—	—	—	—	1E-03	—
Nickel	5E-03	—	8E-03	—	7E-03	—	6E-03	—	—
Nitrate	7E-06	—	5E-06	—	7E-06	—	—	9E-06	—
Nitrite	4E-05	—	6E-05	—	3E-05	—	—	4E-05	—
Selenium	9E-04	—	5E-04	—	8E-04	—	1E-03	—	—
Silver	2E-04	—	2E-04	—	2E-04	—	—	2E-04	—
Strontium	7E-04	—	7E-04	—	6E-04	—	—	6E-04	—
Toluene	—	4E-08	—	5E-08	—	4E-08	—	—	4E-08
Vanadium	1E-01	—	1E-01	—	1E-01	—	—	1E-01	—
Zinc	2E-03	—	2E-03	—	2E-03	—	—	2E-03	—
HI_{Sample}[b]	1E+00	9E-08	1E+00	1E-07	1E+00	1E-07	1E-01	1E+00	4E-08
$HI_{SampleDepth}$[c,d]	**1.3**		**1.2**		**1.2**		**1.4**		

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific noncarcinogenic Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum HI_{Sample}$ for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-89. Results of Non-Cancer Hazard for Exposure Area F + G based on WAC Residential Scenario.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient[a]**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5E-08	—	5E-08	—
Aluminum	8E-02	—	6E-02	—	6E-02	—	—	—	—	9E-02	8E-02	—	8E-02	—	—	9E-02	—	7E-02
Antimony	—	—	—	—	—	—	—	—	6E-03	—	8E-03	—	8E-03	—	—	4E-03	—	—
Aroclor-1260	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	1E-01	—	9E-02	—	8E-02	—	—	—	1E-01	—	1E-01	—	2E-01	—	—	1E-01	—	1E-01
Barium	4E-03	—	3E-03	—	5E-03	—	—	—	—	8E-03	4E-03	—	4E-03	—	—	6E-03	—	5E-03
Beryllium	—	—	—	—	—	—	—	—	2E-03	—	1E-03	—	1E-03	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	1E-03	—	2E-03	—	5E-03	—	—	—	—	—	—	—	—	—	—	—	—	4E-04
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-06	—	—	5E-06	—	—
Cadmium	1E-03	—	—	—	—	—	—	—	2E-03	—	1E-03	—	1E-03	—	—	9E-04	—	9E-04
Chromium	7E-05	—	8E-05	—	4E-05	—	—	—	—	7E-05	5E-05	—	8E-05	—	—	8E-05	—	5E-05
Cobalt	3E-01	—	2E-01	—	3E-01	—	—	—	4E-01	—	4E-01	—	3E-01	—	—	3E-01	—	4E-01
Copper	4E-03	—	3E-03	—	3E-03	—	—	—	—	3E-03	4E-03	—	4E-03	—	—	4E-03	—	5E-03
Fluoride	3E-04	—	1E-04	—	2E-04	—	—	—	—	2E-04	—	2E-04	7E-04	—	—	3E-04	—	4E-04
Gamma-BHC (Lindane)	—	—	—	—	2E-04	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	3E-01	—	3E-01	—	4E-01	—	—	—	4E-01	—	4E-01	—	3E-01	—	—	4E-01	—	5E-01
Lithium	5E-02	—	4E-02	—	2E-02	—	—	—	—	5E-02	4E-02	—	5E-02	—	—	4E-02	—	3E-02
Manganese	2E-02	—	2E-02	—	3E-02	—	—	—	—	4E-02	3E-02	—	3E-02	—	—	3E-02	—	3E-02
Mercury	—	—	—	—	—	—	—	—	—	—	1E-03	—	—	—	—	—	—	—
Methylene chloride	—	4E-06	—	4E-06	—	—	—	4E-06	—	—	—	—	—	—	—	—	—	—
Nickel	6E-03	—	6E-03	—	4E-03	—	—	—	—	8E-03	7E-03	—	7E-03	—	—	7E-03	—	5E-03
Nitrate	8E-06	—	6E-06	—	8E-06	—	—	—	—	9E-06	8E-06	—	2E-05	—	—	7E-06	—	8E-06
Nitrite	1E-04	—	9E-05	—	6E-05	—	—	—	—	2E-04	1E-04	—	7E-05	—	—	5E-05	—	1E-04
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	8E-09	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-04	—	2E-04
Strontium	5E-04	—	5E-04	—	5E-04	—	—	—	—	6E-04	6E-04	—	1E-03	—	—	7E-04	—	6E-04
Styrene	—	4E-08	—	2E-08	—	2E-08	—	2E-08	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	1E-04	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-07	4E-08	—	4E-08	—
Vanadium	1E-01	—	1E-01	—	2E-01	—	—	—	—	2E-01	1E-01	—	8E-02	—	—	2E-01	—	2E-01
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-08	—	—	—	—
Zinc	1E-03	—	1E-03	—	1E-03	—	—	—	—	2E-03	2E-03	—	1E-03	—	—	1E-03	—	2E-03
HI_{Sample}[b]	1E+00	4E-06	8E-01	4E-06	1E+00	2E-08	—	4E-06	1E+00	4E-01	1E+00	2E-04	1E+00	2E-07	9E-08	1E+00	9E-08	1E+00
$HI_{SampleDepth}$[c,d]	**1.0**		0.8		**1.1**		**1.3**				**1.2**		**1.0**		<0.01	**1.2**		**1.3**

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum$ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-90. Results of Non-Cancer Hazard for Exposure Area H + I based on WAC Residential Scenario.

Well Name	C7680								C7682								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**																
Aluminum	1E-01	—	6E-02	9E-02	—	9E-02	—	—	7E-02	—	—	8E-02	8E-02	—	—	8E-02	—
Antimony	6E-03	—	2E-03	3E-03	—	7E-03	—	—	1E-02	—	—	3E-03	3E-03	—	—	7E-03	—
Arsenic	2E-01	—	1E-01	1E-01	—	2E-01	—	—	2E-01	—	—	1E-01	8E-02	—	—	3E-01	—
Barium	5E-03	—	5E-03	6E-03	—	5E-03	—	—	4E-03	—	—	6E-03	6E-03	—	—	5E-03	—
Beryllium	1E-03	—	—	9E-04	—	1E-03	—	—	1E-03	—	—	1E-03	1E-03	—	—	1E-03	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	1E-05	—	—	—	—
Cadmium	1E-03	—	9E-04	8E-04	—	1E-03	—	—	2E-03	—	—	2E-03	2E-03	—	1E-03	—	—
Chromium	8E-05	—	4E-05	2E-04	—	8E-05	—	—	6E-05	—	—	8E-05	1E-04	—	—	6E-05	—
Cobalt	3E-01	—	5E-01	4E-01	—	3E-01	—	—	3E-01	—	—	4E-01	4E-01	—	—	3E-01	—
Copper	3E-03	—	4E-03	4E-03	—	4E-03	—	—	4E-03	—	—	4E-03	4E-03	—	—	4E-03	—
Di-n-butylphthalate	—	—	—	—	—	—	7E-05	—	—	—	—	—	—	—	—	—	—
Fluoride	2E-04	—	8E-05	3E-04	—	2E-04	—	—	3E-04	—	—	3E-04	3E-04	—	—	4E-04	—
Iron	4E-01	—	6E-01	5E-01	—	4E-01	—	—	3E-01	—	—	4E-01	4E-01	—	—	3E-01	—
Lithium	5E-02	—	2E-02	4E-02	—	5E-02	—	—	4E-02	—	—	4E-02	4E-02	—	—	5E-02	—
Manganese	3E-02	—	3E-02	4E-02	—	3E-02	—	—	2E-02	—	—	3E-02	4E-02	—	—	3E-02	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	5E-03	5E-03	—	—	—	—
Nickel	5E-03	—	4E-03	1E-02	—	7E-03	—	—	6E-03	—	—	7E-03	8E-03	—	—	6E-03	—
Nitrate	2E-05	—	5E-06	1E-05	—	—	2E-05	—	4E-05	—	—	2E-05	2E-05	—	—	1E-04	—
Nitrite	3E-05	—	3E-05	5E-05	—	1E-05	—	—	—	—	—	8E-05	6E-05	—	—	5E-05	—
Selenium	1E-03	—	2E-03	2E-03	—	2E-03	—	—	3E-03	—	—	3E-03	3E-03	—	—	3E-03	—
Silver	2E-04	—	1E-04	2E-04	—	2E-04	—	—	—	—	—	—	—	—	—	—	—
Strontium	5E-04	—	4E-04	7E-04	—	7E-04	—	—	4E-04	—	—	6E-04	8E-04	—	—	6E-04	—
Styrene	—	2E-08	—	—	2E-08	—	—	2E-08	—	2E-08	2E-08	—	—	3E-08	—	—	3E-08
Toluene	—	6E-08	—	—	9E-08	—	—	4E-08	—	5E-08	5E-08	—	—	2E-07	—	—	6E-08
Vanadium	1E-01	—	2E-01	2E-01	—	1E-01	—	—	6E-02	—	—	1E-01	1E-01	—	—	7E-02	—
Zinc	2E-03	—	2E-03	2E-03	—	2E-03	—	—	1E-03	—	—	2E-03	2E-03	—	—	2E-03	—
HI_{Sample}[b]	1E+00	8E-08	1E+00	1E+00	1E-07	1E+00	9E-05	6E-08	1E+00	7E-08	8E-08	1E+00	1E+00	2E-07	1E-03	1E+00	9E-08
$HI_{SampleDepth}$[c,d]	**1.2**		**1.5**	**1.4**		**1.3**			**1.0**		<0.01	**1.3**	**1.3**			**1.2**	

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum$ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-91. Results of Non-Cancer Hazard for Exposure Area J based on WAC Residential Scenario. (2 sheets)

Well Name	C8100			
Sample ID	B2B1L6	B2B1L7	B2C1M2	B2C1M3
Top (feet)	0	0	5.7	15
Bottom (feet)	1	1	7.7	19
COPC	COPC-Specific Hazard Quotient[a]			
Aluminum	1E-01	—	9E-02	9E-02
Antimony	7E-03	—	7E-03	7E-02
Arsenic	1E-01	—	2E-01	3E-01
Barium	2E-02	—	5E-03	5E-03
Beryllium	2E-03	—	1E-03	8E-04
Bis(2-ethylhexyl) phthalate	—	—	—	1E-03
Boron	3E-03	—	4E-04	4E-04
Butylbenzylphthalate	—	—	—	5E-06
Cadmium	1E-03	—	1E-03	1E-03
Chromium	9E-05	—	1E-04	8E-05
Cobalt	3E-01	—	3E-01	3E-01
Copper	—	4E-03	4E-03	4E-03
Fluoride	1E-04	—	2E-04	3E-04
Iron	3E-01	—	4E-01	4E-01
Lithium	5E-02	—	5E-02	5E-02
Manganese	—	3E-02	3E-02	3E-02
Mercury	—	7E-04	—	5E-04
Nickel	9E-03	—	6E-03	7E-03
Nitrate	6E-06	—	2E-05	2E-05
Nitrite	—	6E-05	1E-04	5E-05
Silver	2E-04	—	1E-04	1E-04
Strontium	3E-03	—	7E-04	7E-04
Tin	6E-05	—	8E-05	—
Vanadium	1E-01	—	1E-01	1E-01
Zinc	1E-03	—	2E-03	2E-03

Table 3-91. Results of Non-Cancer Hazard for Exposure Area J based on WAC Residential Scenario. (2 sheets)

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**			
HI_{Sample}[b]	1E+00	3E-02	1E+00	1E+00
$HI_{SampleDepth}$[c,d]	**1.1**		**1.2**	**1.5**

COPC = contaminant of potential concern
HI = hazard index
WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum$ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-92. Results of Non-Cancer Hazard for Exposure Area L1 + L2 based on WAC Residential Scenario.

Well Name	C7466									C7670						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific Hazard Quotient**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	3E-06	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	6E-07	—	—
Aluminum	—	—	7E-02	—	6E-02	—	—	—	9E-02	7E-02	8E-02	—	—	—	7E-02	7E-02
Antimony	—	—	—	—	—	—	—	—	2E-02	3E-03	—	—	9E-03	—	3E-03	2E-03
Arsenic	2E-01	—	8E-02	—	8E-02	—	—	—	2E-01	9E-02	2E-01	—	—	—	1E-01	1E-01
Barium	7E-03	—	3E-03	—	3E-03	—	—	—	5E-03	4E-03	—	—	5E-03	—	3E-03	3E-03
Beryllium	—	—	—	—	—	—	—	—	—	9E-04	—	—	1E-03	—	7E-04	7E-04
Bis(2-ethylhexyl) phthalate	1E-03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	3E-06	—	—	—	4E-06	—	—	—	—	—	—	—
Cadmium	1E-03	—	4E-04	—	8E-04	—	—	—	2E-03	8E-04	—	—	1E-03	—	9E-04	7E-04
Chromium	9E-05	—	6E-05	—	7E-05	—	—	—	7E-05	9E-05	6E-05	—	—	—	7E-05	7E-05
Cobalt	4E-01	—	2E-01	—	2E-01	—	—	3E-01	—	2E-01	4E-01	—	—	—	2E-01	2E-01
Copper	5E-03	—	3E-03	—	3E-03	—	—	—	4E-03	3E-03	—	—	4E-03	—	3E-03	3E-03
Fluoride	3E-04	—	1E-04	—	8E-05	—	—	1E-04	—	2E-04	3E-04	—	—	—	2E-04	2E-04
Iron	5E-01	—	2E-01	—	3E-01	—	—	—	4E-01	3E-01	4E-01	—	—	—	3E-01	3E-01
Lithium	5E-02	—	4E-02	—	3E-02	—	—	—	4E-02	4E-02	—	—	5E-02	—	4E-02	4E-02
Manganese	4E-02	—	2E-02	—	2E-02	—	—	—	4E-02	2E-02	—	—	3E-02	—	2E-02	2E-02
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4E-04	7E-04
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6E-03	6E-03
Nickel	8E-03	—	5E-03	—	5E-03	—	—	—	1E-02	7E-03	7E-03	—	—	—	5E-03	5E-03
Nitrate	2E-05	—	6E-06	—	3E-06	—	—	—	1E-05	1E-05	—	—	7E-06	—	7E-06	6E-06
Nitrite	1E-04	—	2E-04	—	—	—	—	8E-05	—	1E-04	—	—	—	—	7E-05	5E-05
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-03	—
Silver	3E-04	—	1E-04	—	2E-04	—	—	—	2E-04	—	—	—	—	—	—	—
Strontium	7E-04	—	5E-04	—	4E-04	—	—	—	6E-04	6E-04	7E-04	—	—	—	5E-04	6E-04
Vanadium	2E-01	—	9E-02	—	1E-01	—	—	—	2E-01	8E-02	9E-02	—	—	—	8E-02	8E-02
Zinc	2E-03	—	1E-03	—	1E-03	—	—	—	2E-03	1E-03	2E-03	—	—	—	1E-03	1E-03
HI_{Sample}[b]	1E+00	—	7E-01	—	9E-01	—	—	3E-01	9E-01	8E-01	1E+00	3E-06	1E-01	6E-07	8E-01	9E-01
$HI_{SampleDepth}$[c,d]	**1.4**		0.7		0.9			**1.3**		0.8	**1.2**			<0.01	0.8	0.9

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI_{Sample} = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-93. Results of Non-Cancer Hazard for Exposure Area P based on WAC Residential Scenario.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific Hazard Quotient[a]**																	
Acetone	1E-07	—	2E-07	1E-07	—	—	—	—	6E-08	—	6E-08	—	2E-07	—	2E-07	—	—	—
Aluminum	—	1E-01	—	—	7E-02	7E-02	1E-01	9E-02	—	8E-02	—	7E-02	—	9E-02	—	9E-02	—	7E-02
Antimony	—	6E-03	—	—	—	—	5E-03	—	—	—	—	—	—	—	—	1E-02	—	—
Aroclor-1260	—	—	—	—	—	3E-98	—	3E-98	—	—	—	—	—	—	—	—	—	—
Arsenic	—	2E-01	—	—	2E-01	2E-01	2E-01	2E-01	—	2E-01	—	2E-01	—	2E-01	—	2E-01	—	7E-02
Barium	—	5E-03	—	—	4E-03	5E-03	5E-03	5E-03	—	4E-03	—	4E-03	—	5E-03	—	5E-03	—	5E-03
Beryllium	—	—	—	—	1E-03	—	2E-03	2E-03	—	1E-03	—	—	—	2E-03	—	2E-03	—	—
beta-BHC	—	—	—	—	3E-98	2E-98	2E-98	—	—	—	—	—	—	—	—	—	—	2E-98
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	5E-04	—	—	—	1E-03	—	—	—	—	—	—
Cadmium	—	2E-03	—	—	1E-03	2E-03	2E-03	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03
Chromium	—	7E-05	—	—	5E-05	4E-05	7E-05	8E-05	—	8E-05	—	6E-05	—	8E-05	—	9E-05	—	2E-04
Cobalt	—	4E-01	—	—	3E-01	3E-01	3E-01	4E-01	—	3E-01	—	3E-01	—	4E-01	—	4E-01	—	4E-01
Copper	—	4E-03	—	—	4E-03	4E-03	4E-03	4E-03	—	4E-03	—	4E-03	—	4E-03	—	4E-03	—	4E-03
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	1E-04	—	—	—	—	—	—
Fluoride	—	1E-03	—	—	4E-04	4E-04	—	4E-04	—	5E-04	—	5E-04	—	3E-04	—	4E-04	—	3E-04
Iron	—	4E-01	—	—	4E-01	4E-01	4E-01	4E-01	—	4E-01	—	4E-01	—	4E-01	—	4E-01	—	5E-01
Lithium	—	5E-02	—	—	4E-02	4E-02	6E-02	5E-02	—	5E-02	—	4E-02	—	5E-02	—	5E-02	—	3E-02
Manganese	—	3E-02	—	—	3E-02	3E-02	3E-02	3E-02	—	3E-02	—	3E-02	—	3E-02	—	3E-02	—	3E-02
Mercury	—	—	—	—	8E-04	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-06	—	2E-06	—	5E-06	—
Nickel	—	8E-03	—	—	5E-03	6E-03	4E-03	4E-03	—	5E-03	—	6E-03	—	6E-03	—	8E-03	—	9E-03
Nitrate	—	2E-05	—	—	1E-05	1E-05	—	2E-05	—	3E-05	—	7E-06	—	2E-05	—	9E-06	—	1E-05
Nitrite	—	—	—	—	2E-04	2E-04	—	2E-04	—	2E-04	—	7E-05	—	2E-04	—	1E-04	—	1E-04
Silver	—	—	—	—	3E-04	3E-04	5E-04	5E-04	—	6E-04	—	4E-04	—	—	—	4E-04	—	—
Strontium	—	7E-04	—	—	6E-04	6E-04	6E-04	6E-04	—	6E-04	—	5E-04	—	8E-04	—	8E-04	—	6E-04
Tin	—	—	—	—	—	—	—	—	—	—	—	2E-04	—	2E-04	—	2E-04	—	3E-04
Toluene	5E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	2E-01	—	—	1E-01	1E-01	2E-01	2E-01	—	2E-01	—	1E-01	—	2E-01	—	2E-01	—	3E-01
Zinc	—	2E-03	—	—	2E-03	1E-02	2E-03	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03
HI_{Sample}[b]	2E-07	1E+00	2E-07	1E-07	1E+00	1E+00	1E+00	1E+00	6E-08	1E+00	6E-08	1E+00	3E-06	1E+00	2E-06	1E+00	5E-06	1E+00
$HI_{SampleDepth}$[c,d]	**1.4**		<0.01	**1.2**		**1.2**	**1.4**	**1.4**		**1.3**		**1.1**	**1.3**		**1.4**		**1.5**	

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum$ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-94. Results of Non-Cancer Hazard for Exposure Area R based on WAC Residential Scenario. (2 sheets)

Well Name	C7668							
Sample ID	B23TK2	B23TK4	B23TK5	B23TK8	B23TL0	B23TL6	B23TM2	B27130
Top (feet)	0	0	0	5	5	10	14	10
Bottom (feet)	1	1	1	7	7	12	16	14
COPC	COPC-Specific Hazard Quotient[a]							
2-Hexanone	—	6E-06	—	—	7E-06	5E-06	—	—
Acetone	—	—	—	—	—	4E-08	9E-08	—
Aluminum	—	—	1E-01	1E-01	—	—	—	8E-02
Antimony	—	—	8E-03	—	—	—	—	5E-03
Arsenic	—	—	2E-01	2E-01	—	—	—	2E-01
Barium	—	—	5E-03	5E-03	—	—	—	4E-03
Beryllium	—	—	1E-03	1E-03	—	—	—	1E-03
Butylbenzylphthalate	—	—	5E-06	7E-06	—	—	—	—
Cadmium	—	—	4E-02	4E-02	—	—	—	4E-02
Chromium	—	—	8E-05	9E-05	—	—	—	8E-05
Cobalt	—	—	4E-01	4E-01	—	—	—	3E-01
Copper	—	—	4E-03	5E-03	—	—	—	3E-03
Fluoride	—	—	2E-04	6E-04	—	—	—	7E-04
Iron	—	—	5E-01	5E-01	—	—	—	4E-01
Lithium	—	—	5E-02	6E-02	—	—	—	5E-02
Manganese	—	—	3E-02	4E-02	—	—	—	3E-02
Mercury	—	—	6E-04	—	—	—	—	—

Table 3-94. Results of Non-Cancer Hazard for Exposure Area R based on WAC Residential Scenario. (2 sheets)

Well Name	C7668							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific Hazard Quotient[a] (continued)**							
Methylene chloride	—	—	—	—	—	—	3E-06	—
Nickel	—	—	7E-03	7E-03	—	—	—	5E-03
Nitrate	—	—	1E-05	2E-05	—	—	—	7E-05
Nitrite	—	—	2E-04	2E-05	—	—	—	—
Selenium	2E-03	—	—	1E-03	—	—	—	2E-03
Silver	1E-04	—	—	1E-04	—	—	—	2E-04
Strontium	—	—	6E-04	8E-04	—	—	—	6E-04
Toluene	—	9E-08	—	—	5E-08	5E-08	—	—
Vanadium	—	—	2E-01	2E-01	—	—	—	1E-01
Zinc	—	—	2E-03	2E-03	—	—	—	2E-03
HI_{Sample}[b]	2E-03	6E-06	2E+00	2E+00	7E-06	5E-06	3E-06	1E+00
$HI_{SampleDepth}$[c,d]	**1.5**			**1.6**		<0.01	<0.01	**1.3**

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] $HI_{Sample} = \sum$ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth} = \sum$ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

Table 3-95. Results of Non-Cancer Hazard for Exposure Area U based on WAC Residential Scenario. (2 sheets)

Well Name	C7676							
Sample ID	B26CC1	B26CC4	B26CC5	B26CC7	B26JK6	B26JK7	B26JL7	B29612
Top (feet)	5	10	10	14	0	0	0	5
Bottom (feet)	7	12	12	16	1	1	1	9
COPC	COPC-Specific Hazard Quotient[a]							
Acetone	—	—	9E-08	8E-08	—	—	—	—
Aluminum	—	6E-02	—	—	9E-02	—	—	1E-01
Antimony	—	5E-03	—	—	7E-03	—	—	9E-03
Arsenic	—	1E-01	—	—	—	2E-01	—	3E-01
Barium	—	3E-03	—	—	6E-03	—	—	5E-03
Benzene	—	—	—	1E-06	—	—	—	—
Beryllium	—	8E-04	—	—	—	1E-03	—	1E-03
Boron	—	—	—	—	4E-04	—	—	—
Chromium	—	7E-05	—	—	6E-05	—	—	8E-05
Cobalt	—	2E-01	—	—	4E-01	—	—	4E-01
Copper	—	3E-03	—	—	—	4E-03	—	4E-03
Fluoride	—	4E-04	—	—	8E-05	—	—	4E-04
Iron	—	3E-01	—	—	4E-01	—	—	4E-01
Lithium	—	3E-02	—	—	—	5E-02	—	6E-02
Manganese	—	2E-02	—	—	3E-02	—	—	3E-02
Mercury	—	—	—	—	—	9E-04	—	4E-04
Molybdenum	—	—	—	—	6E-03	—	—	6E-03
Nickel	—	4E-03	—	—	5E-03	—	—	6E-03
Nitrate	—	1E-05	—	—	1E-05	—	—	1E-05
Nitrite	—	3E-05	—	—	—	4E-05	—	9E-05
Selenium	—	3E-03	—	—	—	3E-03	—	5E-03
Strontium	—	5E-04	—	—	—	1E-03	—	8E-04
Styrene	—	—	—	—	—	—	2E-08	—
Toluene	9E-08	—	9E-08	1E-07	—	—	1E-07	—
Vanadium	—	1E-01	—	—	1E-01	—	—	1E-01
Zinc	—	1E-03	—	—	2E-03	—	—	2E-03

Table 3-95. Results of Non-Cancer Hazard for Exposure Area U based on WAC Residential Scenario. (2 sheets)

Well Name	C7676							
Sample ID	B26CC1	B26CC4	B26CC5	B26CC7	B26JK6	B26JK7	B26JL7	B29612
COPC (continued)	COPC-Specific Hazard Quotient[a] (continued)							
HI_{Sample}[b]	9E-08	9E-01	2E-07	1E-06	1E+00	2E-01	1E-07	1E+00
$HI_{SampleDepth}$[c,d]	<0.01	0.9		<0.01	**1.2**			**1.4**

COPC = contaminant of potential concern HI = hazard index WAC = *Washington Administrative Code*

[a] COPC-Specific Hazard Quotient = Soil Concentration (µg/kg) / COPC-Specific Noncarcinogen Cleanup Level (µg/kg).

[b] HI_{Sample} = ∑ COPC-Specific Hazard Quotients.

[c] $HI_{SampleDepth}$ = ∑ HI for each depth interval.

[d] **Bold** indicates exceedance of *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act" acceptable target HI of 1.

3.2.2.5 Comparison of Risk Characterization Results for Nonradiological Contaminants of Potential Concern Using Statistical and Sample-By-Sample Approach. The results of the risk and hazard evaluations using a statistically-based approach were compared against the sample-by-sample approach. Table 3-96 presents the comparison of EA-specific nonradiological risk results for both receptors. For the WAC industrial worker and WAC residential receptor, the ELCRs based on a sample-by-sample approach for five EAs (A+B, F+G, H+I, L1+L2 and P) are slightly higher than the corresponding ELCRs based on a statistical approach. It should be noted that calculated ELCRs for those five EAs using both approaches did not exceed the upper risk threshold value of 1E-5.

For the WAC residential receptor, the HIs based on a sample-by-sample approach for two EAs (A+B and L1+L2) are slightly higher than their corresponding HIs based on a statistical approach. It should also be noted that calculated HIs using both methods were greater than the acceptable HI target of 1.

3.2.3 MTCA Groundwater Protection Scenario for Nonradiological Contaminants Using the Fixed-Parameter Three-Phase Model

A "protection of groundwater pathway" assessment was performed using the sample-by-sample approach to evaluate the potential impacts to the groundwater. All soil samples collected from both the shallow zone (0 to 15 ft bgs) and the deep vadose zone (>15 ft bgs) were utilized to assess groundwater protection.

Table 3-96. Comparison of Risk and Hazard Evaluations based on Statistical Sample Approach and Sample-By-Sample Approach.

Exposure Area	Model Toxics Control Act Method C				Model Toxics Control Act Method B			
	Statistical Approach	Sample-by-Sample Approach	Statistical Approach	Sample-by-Sample Approach	Statistical Approach	Sample-by-Sample Approach	Statistical Approach	Sample-by-Sample Approach
	Excess Lifetime Cancer Risk	Range of Excess Lifetime Cancer Risks[1]	Hazard Index	Range of Hazard Indices[2]	Excess Lifetime Cancer Risk	Range of Excess Lifetime Cancer Risks	Hazard Index	Range of Hazard Indices
A+B	4E-07	3E-7 to 6E-7	3E-02	3E-2 to 3E-2	6E-06	4E-6 to 8E-6	1.4	1.1 to 1.5
C	2E-06	4E-7 to 2E-6	5E-02	3E-2 to 5E-2	3E-05	6E-6 to 3E-5	2.4	1.4 to 2.1
E	6E-07	3E-7 to 6E-7	3E-02	3E-2 to 3E-2	8E-06	4E-6 to 8E-6	1.5	1.2 to 1.4
F+G	4E-07	2E-7 to 5E-7	3E-02	9E-10 to 3E-2	5E-06	3E-6 to 6E-6	1.3	<0.01 to 1.3
H+I	6E-07	2E-7 to 8E-7	4E-02	5E-10 to 3E-2	8E-06	3E-6 to 1E-5	1.5	<0.01 to 1.5
J	9E-07	4E-7 to 9E-7	4E-02	2E-2 to 3E-2	1E-05	5E-6 to 1E-5	1.6	1.1 to 1.5
L1+L2	4E-07	2E-7 to 5E-7	3E-02	1E-8 to 3E-2	5E-06	3E-6 to 7E-6	1.3	<0.01 to 1.4
P	6E-07	2E-7 to 7E-7	3E-02	4E-9 to 3E-2	8E-06	3E-6 to 9E-6	1.5	<0.01 to 1.4
R	7E-07	2E-13 to 7E-7	4E-02	7E-8 to 4E-2	9E-06	3E-12 to 9E-6	1.6	<0.01 to 1.6
U	8E-07	1E-12 to 8E-7	3E-02	2E-9 to 3E-2	1E-05	2E-11 to 1E-5	1.5	<0.01 to 1.4

[1] The range of excess lifetime cancer risk represents the minimum and the maximum excess lifetime cancer risks within the different depth interval.
[2] The range of hazard indices represents the minimum and the maximum hazard index within the different depth interval.

Reference: *Revised Code of Washington* 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act."

3.2.3.1 Data Evaluation for Protection of Groundwater Pathway. Two data evaluations were performed. Each is summarized below.

1. **Comparison of Detected Soil Concentrations to Soil Concentrations Protective of Groundwater**: The detected concentration for each nonradiological contaminant was compared with its corresponding groundwater protective soil concentration. If the detected concentration for a nonradiological contaminant was less than its corresponding soil concentration protective of groundwater, then the contaminant is not considered a potential threat to groundwater. When soil concentrations were greater than the soil concentration protective of groundwater, then they were carried into the next step.

   ECF-HANFORD-10-0442 presents the soil concentrations protective of groundwater for nonradiological contaminants per the requirements set forth in the 2013 WAC 173-340-747(4).

2. **Comparison of Soil Concentrations to Hanford Site Background Soil Concentrations**: To distinguish between naturally-occurring soil background concentrations and potential site-related contamination, a background evaluation step was performed. A comparison between the Hanford Site 90th percentile background concentration and the detected soil concentration was performed to determine if the contaminant exceeded background concentrations. If the contaminant exceeded both the soil concentration protective of groundwater and the background concentration, it was retained for further evaluation.

3.2.3.2 Results of Data Evaluations. Appendix H presents the results of 2 data evaluations. Of the 3,603 individual samples evaluated, 61 sampling results representing 5 analytes exceeded their corresponding soil concentrations protective of groundwater and/or background concentrations. These analytes are arsenic, cadmium, hexavalent chromium, thallium and beta-BHC. It is noted that beta-BHC does not have reported background concentrations. The results for each of the 5 analytes are summarized below.

- Arsenic – One sample result (21.2 mg/kg) exceeded the corresponding soil concentration protective of groundwater (2.92 mg/kg) and the arsenic value of 20 mg/kg provided in Memorandum 1221558.

- Cadmium – 18 sample results (concentrations ranged between 1.16 mg/kg and 3.47 mg/kg) exceeded both the corresponding soil concentration protective of groundwater (0.69 mg/kg) and the Hanford Site 90th percentile background concentration (0.56 mg/kg).

- Hexavalent Chromium –Soil samples were only analyzed for total chromium and were not analyzed for hexavalent chromium. Therefore, total chromium results were compared to the corresponding soil concentration protective of groundwater (2,000 mg/kg). The results showed that all sample results were less than the soil concentration protective of groundwater, derived for the River Corridor remedial investigation/feasibility study documents. In response to Ecology's comment, if the

chromium reported as total chromium is assumed to be present only as hexavalent chromium, then all sample results exceeded the soil concentration protective of groundwater (0.19 mg/kg).

- Thallium –In response to Ecology's comment and for screening purposes[3] only, soil sampling results for thallium were compared against the corresponding soil concentration limit protective of groundwater. Three thallium sample results (concentrations range between 0.714 mg/kg and 20.8 mg/kg) exceeded the corresponding soil concentration protective of groundwater (0.71 mg/kg) and the thallium Hanford Site 90th percentile background concentration (0.185 mg/kg).

- Beta-BHC – 12 soil sample results (concentrations range between 19.4 µg/kg and 25.8 µg/kg) exceeded the corresponding soil concentration protective of groundwater (2.28 µg/kg).

3.2.3.3 Comparison of Protection of Groundwater Pathway Assessment Results Using the Statistical and Sample-By-Sample Approach. The results of the protection of groundwater pathway assessment based on a statistical approach showed that the EPCs for three COPCs (cadmium, beta-BHC and lindane) exceeded their corresponding three-phase model concentrations and background levels at a number of exposure areas. The results of the protection of groundwater pathway assessment based on a sample-by-sample approach showed that the individual sample results for five COPCs (arsenic, cadmium, hexavalent chromium, thallium and beta-BHC) exceeded their corresponding soil concentrations protective of groundwater and background when available. It should be noted that hexavalent chromium and thallium were not included in the statistical approach.

3.3 SUPPLEMENTAL HUMAN HEALTH RISK ASSESSMENT

Three supplemental RAs were conducted to support the CMS alternatives evaluation process as documented in RPP-RPT-59379, *Waste Management Area C Phase 2 Corrective Measures Study Report*. They are (1) supplemental human health risk assessment for exposure areas; (2) supplemental human health risk assessment for unplanned releases; and (3) supplemental human health risk assessment for past leaks, surface releases and French drain. The following sections briefly summarize the methodologies and results of the supplemental RAs detailed in that report.

[3] Thallium toxicity value is obtained from Provisional Peer Reviewed Toxicity Value (PPRTV) (EPA/690/R-12/029F, *Provisional Peer-Reviewed Toxicity Values for Thallium and Compounds*). However, the applicable reference source is noted as "X" (for Appendix) instead of a "P" (PPRTV). PPRTV Appendix-referenced toxicity screening values are distinct from PPRTV-referenced values and do not carry the same "weight." The Regional Screening Level working group regards "PPRTV Appendix-referenced toxicity screening values" as Tier 3 toxicity values. According to the group, medium-specific screening levels based upon PPRTV Appendix toxicity screening values generally have more uncertainty. Therefore, those analytes are reported with screening chronic RfD values and the resulting concentrations will be limited to screening and are not adequate for use as cleanup levels.

3.3.1 Supplemental Human Health Risk Assessment for Exposure Areas

According to Section 3.1.5.1.1 and Table 3-3, the ELCRs for radiological COPCs for the CERCLA industrial worker scenario are greater than the EPA upper risk threshold of 1×10^{-4} at five EAs (A+B, C, E, L1+L2 and P). For nonradiological COPCs, the results showed that the EA-specific ELCR for non-radiological COPCs is within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6} and is less than the MTCA cumulative threshold risk of 1×10^{-5}. The result also showed that the EA-specific HIs for non-radiological COPCs were less than the EPA and MTCA acceptable target HI of 1. Therefore, nonradiological COPCs were not identified under an industrial worker scenario and were not further evaluated.

It should be noted that no type of protective cover was considered during the RA presented in Sections 3.1 and 3.2. The results showed that the external gamma pathway is the predominant exposure pathway for contaminated soils. Therefore, several remedial alternatives such as isolation barriers and/or infiltration barriers are being considered to mitigate the risk associated with the external gamma pathway. Based on the design of the remedial alternatives, a 4-in. isolation barrier is being considered at each EA. Therefore, a radiological RA was performed for the same CERCLA industrial worker scenario considered in the RA to determine the impacts of a 4-in. barrier on reduction for each EA. The exposure pathways and the assigned values for exposure parameters associated with the CERCLA industrial worker scenario are the same for both the RA and this supplemental HHRA.

For risk characterization, RESRAD Version 6.5 (ANL 2009a) was utilized in part to determine the risk to an industrial worker at each EA. However, RESRAD Version 7.0 (ANL 2014) was used during the calculation of EA-specific ELCRs for radiological COPCs over a period of 1,000 years. The results of the maximum ELCR over a period of 1,000 years are summarized in Table 3-97.

Table 3-97. Maximum Risk Assessment Results Based on 4- inch Isolation Barrier for CERCLA Industrial Worker Scenario.

Exposure Pathways	Exposure Areas									
	A + B	**C**	**E**	**F v G**	**H + I**	**J**	**L1 + L2**	**P**	**R**	**U**
External Gamma	6E-05	7E-05	3E-05	5E-06	9E-06	4E-06	1E-05	2E-05	7E-08	9E-06
Inhalation	9E-11	2E-13	9E-13	3E-10	1E-07	3E-10	7E-09	4E-07	1E-12	4E-11
Soil Ingestion	9E-08	4E-08	3E-08	1E-08	1E-08	2E-08	3E-08	3E-07	1E-08	3E-08
Excess Lifetime Cancer Risk	6E-05	7E-05	3E-05	5E-06	9E-06	4E-06	1E-05	2E-05	8E-08	9E-06

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*

The result showed that the maximum ELCR assuming barrier installation for each EA evaluated is within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6}.

3.3.2 Supplemental Human Health Risk Assessment for Unplanned Releases

High levels of radiological contamination are present at three UPR locations within WMA C: 200-E-81 (UPR-81), 200-E-82 (UPR-82), and 200-E-86 (UPR-86). Due to safety concerns, no samples were collected, and RAs were not performed at these UPR locations. Therefore, supplemental HHRAs were conducted for both radiological and nonradiological COPCs present within these three UPRs. Detailed information related to those assessments is included in RPP-RPT-59379. The following sections summarize the methodologies and results of the three UPR RAs.

3.3.2.1 Radiological Risk Assessment for Unplanned Releases. For the soil contamination associated with UPRs, radiological risks are estimated assuming no cover for the CERCLA industrial worker exposure scenario. Several remedial alternatives such as isolation barriers and/or infiltration barriers are being considered to minimize the risk associated with the elevated radiological contaminants within the UPRs. The remedial alternative proposed is a 3-ft isolation barrier at each UPR. As a result, radiological RAs were estimated for the three UPRs, assuming a 3-ft concrete cover to determine the impacts of the isolation barrier with respect to the total risk at each UPR under post-remediation conditions. RESRAD Version 7.0 (ANL 2014) was used for both RAs, a noted departure from the WMA C RA, which used RESRAD Version 6.5 (ANL 2009a).

Information related to radionuclides and their corresponding inventories for each UPR within RPP-ENV-33418, *Hanford C-Farm Leak Inventory Assessments Report* were utilized to identify the COPCs and the derivation of their corresponding source-term concentrations. Four exclusion criteria were used to identify soil COPCs for each UPR. Radionuclides that met one or more of the criteria were excluded. Radionuclides that did not meet any of the exclusion criteria were carried forward into the RA. The exclusion criteria are as follows.

1. **Exclusion of Radionuclides Based on DQOs for WMA C Phase 2 Site Characterization**

   Table 4-11 of RPP-RPT-38152 presented primary radionuclide constituents for WMA C. Therefore, all other radionuclides included in RPP-ENV-33418, but not identified as a primary constituent in Table 4-11 of RPP-RPT-38152, are excluded from further consideration.

2. **Exclusion of Radionuclides Based on Mobility of Radionuclides**

   Based on the results of the past leak analysis (RPP-RPT-59197), mobile radiological contaminants are not expected to be present within the contaminated zone (0 to 4.6 m [15 ft] bgs). Therefore, only non-mobile radiological contaminants are considered during the RAs.

   Table 6-11 of RPP-ENV-58782 presented the K_d values for various radionuclides for WMA C. According to that report, the maximum K_d value that produces an impact to groundwater is approximately 0.15 mL/g (without any gravel correction) within the

1,000-year compliance time frame, and approximately 1.5 mL/g (without any gravel correction) within the 10,000-year compliance time frame. Therefore, radionuclides with a K_d value <0.15 mL/g are excluded due to high mobility in the vadose zone. Four radionuclides were excluded based on K_d values corresponding to high mobility.

3. **Exclusion of Radionuclides with Half-Lives of Less than 3 Years**

   Radionuclides with half-lives less than 3 years are eliminated from further consideration as soil COPCs. This is because they are either insignificant risk contributors due to decay or their contributions are already accounted for as daughter products of a parent radionuclide. Five radionuclides were excluded based on a half-life less than 3 years.

4. **Exclusion of Naturally-Occurring Radionuclides**

   The radionuclides considered to be naturally occurring and not directly related to Hanford Site operations or processes are eliminated from further consideration as soil COPCs. Six naturally-occurring radionuclides associated with background radiation (^{40}K, ^{226}Ra, ^{228}Ra, ^{228}Th, ^{230}Th, and ^{232}Th) were excluded.

Application of the exclusion criteria resulted in the identification of 22 COPCs for each UPR. In the absence of sample concentrations, the source-term concentrations for these 22 COPCs were calculated by utilizing information related to COPC-specific inventories and assessing the impacted soil mass for those releases. As a conservative approach, the inventories of the radiological contaminants were assumed to be uniformly distributed throughout the affected soil volume. Table 3-98 presents the source-term concentrations for each of the 22 radiological COPCs for each UPR.

The source-term concentrations for the radiological COPCs were then entered into the RESRAD model to assess radiological ELCRs under no cover and cover conditions for the CERCLA industrial worker scenario. Table 3-99 presents the maximum radiological ELCRs for each UPR under no cover and cover conditions.

Under no cover condition, the results presented in Table 3-99 indicate that the radiological ELCRs for all UPRs are greater than EPA's acceptable risk threshold of 10^{-4}. Cesium-137 was identified as a major risk contributor (>99% of total risk) for all three UPRs. Under post-remediation conditions, the radiological ELCRs for all UPRs are within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6}.

3.3.2.2 Nonradiological Risk Assessment for Unplanned Releases. A nonradiological RA was conducted for each UPR for the CERCLA industrial worker scenario and WAC industrial worker receptor scenario.

Table 3-98. Source-Term Concentrations for Radiological Contaminants of Potential Concern.

Radiological Contaminant of Potential Concern	Soil Concentration (pCi/g)		
	UPR-81	UPR-82	UPR-86
Am-241	2,628.2	593.9	195.2
C-14	518.7	269.4	88.6
Cm-243	0.0	0.1	2E-02
Cm-244	0.1	0.9	0.3
Cs-137	211,647	45,504,201	14,959,774
Eu-152	1.1	40.7	13.4
Eu-154	52.6	2032.3	668.1
Eu-155	10.2	395.9	130.2
I-129	84.7	0.9	0.3
Ni-63	328,667.4	10,464.2	3,440.2
Np-237	0.6	41.4	13.6
Pu-238	52.1	19.3	6.3
Pu-239	2,445.6	455.5	149.8
Pu-240	576.7	111.6	36.7
Pu-241	2939.1	700.3	230.2
Sn-126	0.97	204.9	67.4
Sr-90	177,620.8	152,724.5	50,209.1
U-233	40.2	1E-04	4E-05
U-234	5.6	1.0	0.3
U-235	0.2	4E-02	1E-02
U-236	0.1	2E-02	8E-03
U-238	5.0	0.9	0.3

UPR = unplanned release

Source concentrations for nonradiological COPCs were estimated by utilizing the information related to COPC-specific inventories for three UPRs presented in RPP-ENV-33418 and assessing impacted soil mass for those releases. Similar to radiological contaminants, mobile nonradiological contaminants are not expected to be present within the shallow vadose zone (0 to 4.6 m [15 ft] bgs) and the inventories of the non-mobile nonradiological contaminants are assumed to be uniformly distributed throughout the affected soil volume. Among non-mobile nonradiological contaminants, aluminum, chromium, iron, lead, mercury, nickel and total uranium were identified as the nonradiological COPCs for three UPRs. Calcium and potassium

are considered to be essential human nutrients; therefore, calcium and potassium were not considered as COPCs. In addition, manganese and strontium have no reported inventories and were excluded as COPCs. Table 3-100 presents the source-term concentrations for each nonradiological COPC for each UPR.

Table 3-99. Radiological Risk Assessment Results under CERCLA Industrial Worker Scenario for Baseline and Post-Remediation Conditions.

Scenario	UPR-81	UPR-82	UPR-86
Baseline (No Soil Cover) Excess Lifetime Cancer Risk	1E+00	2E+02	8E+01
Post-Remediation (3-ft Concrete Cover) Excess Lifetime Cancer Risk	9E-09	2E-06	6E-07

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
UPR = unplanned release

Table 3-100. Source-Term Concentrations for Nonradiological Contaminants of Potential Concern.

Nonradiological Contaminant of Potential Concern	Soil Concentration (mg/kg)		
	UPR-81	UPR-82	UPR-86
Aluminum	8220	—	—
Chromium	77.2	38.3	12.6
Iron	50.8	9.5	3.1
Nickel	43.6	9.7	3.2
Lead	72.3	13.5	4.4
Total Uranium	15.0	2.8	0.9

UPR = unplanned release

Tables 3-101 and 3-102 present the results of nonradiological RA for each UPR. For carcinogenic COPCs, the total ELCR for all UPRs was less than the EPA's acceptable target risk range of 10^{-4} to 10^{-6} and the 2013 MTCA cumulative risk threshold of 1×10^{-5}. Therefore, nonradiological risk contributors were not identified. For noncarcinogenic COPCs, the HI for all UPRs was less than the CERCLA and 2013 MTCA target HI of 1 [WAC 173-340-708(5)]. Therefore, nonradiological non-cancer hazard contributors were not identified.

3.3.3 Supplemental Human Health Risk Assessment for Past Tank Leaks, Surface Releases and 216-C-8 French Drains

Supplemental HHRAs were performed for the radionuclide soil contamination associated with past leaks originating from six SSTs (241-C-101, 241-C-104, 241-C-105, 241-C-108, 241-C-110, and 241-C-112), soil contamination resulting from past discharges to the

216-C-8 French drain, and the surface contamination associated with non-specific contaminant migration due to releases and activities within WMA C. Supplemental human health dose assessments were also performed for soil contamination associated with past leaks originating from six SSTs to meet the radiological dose limit of 500 mrem/yr, consistent with DOE M 435.1-1, *Radioactive Waste Management Manual*. They are summarized in the following section.

Table 3-101. Nonradiological Risk Assessment Results for Three Unplanned Releases under CERCLA Industrial Worker Scenario.

Exposure Pathways	UPR-81		UPR-82		UPR-86	
	ELCR	HI	ELCR	HI	ELCR	HI
Ingestion	0E+00	2E-02	0E+00	6E-03	0E+00	2E-03
Inhalation	7E-09	1E-05	4E-09	2E-06	1E-09	6E-07
Dermal Contact	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cumulative Risk	**7E-09**	0.02	**4E-09**	**0.01**	**1E-09**	**0.002**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk HI = hazard index UPR = unplanned release

Table 3-102. Nonradiological Risk Assessment Results for Three Unplanned Releases under WAC Industrial Worker Scenario.

Exposure Pathways	UPR-81		UPR-82		UPR-86	
	ELCR	HI	ELCR	HI	ELCR	HI
Ingestion	0E+00	1E-02	0E+00	4E-03	0E+00	1E-03
Inhalation	4E-08	4E-05	2E-08	8E-06	6E-09	3E-06
Cumulative Risk	**4E-08**	**0.01**	**2E-08**	**0.004**	**6E-09**	**0.001**

ELCR = excess lifetime cancer risk UPR = unplanned release
HI = hazard index WAC = *Washington Administrative Code*

3.3.3.1 Supplemental Human Health Risk and Dose Assessment for Past Tank Leaks.

Supplemental human health radiological dose and risk assessments were performed for past leaks from six tanks. The CERCLA construction worker scenario was evaluated because releases from these tanks were at 6.1 m (20 ft) bgs and it assumes that subsurface contamination is brought to the surface from excavation activities. Because the releases occurred below 15 ft bgs, there are no complete direct exposure pathways for either radiological or nonradiological contaminants.

COPCs for the six past tank leaks were identified by applying the same four exclusion criteria summarized in Section 3.3.2.1. Radionuclides that met one or more of the criteria were excluded. Radionuclides that did not meet any of the exclusion criteria were carried forward into

the RA. Application of the exclusion criteria resulted in the identification of 22 radiological COPCs.

In the absence of sample concentration, the source-term concentrations for COPCs associated with the six past tank leaks were calculated by utilizing information related to COPC-specific release inventories and the impacted soil mass for those releases. Table 3-103 presents the source-term concentrations for radiological COPCs in affected soil for six past tank leaks.

Table 3-103. Source-Term Concentrations for Radionuclide Contaminants of Potential Concern in Leak Affected Soil for Waste Management Area C Past Tank Leaks.

Radionuclide Contaminant of Potential Concern	Soil Concentration (pCi/g)					
	241-C-101	241-C-104	241-C-105	241-C-108	241-C-110	241-C-112
Am-241	9,490	183	365	148	578	141
C-14	2,347	45	166	36	333	34
Cm-243	0.017	4.52E-05	0.031	3.67E-05	0.046	3.49E-05
Cm-244	0.36	9.34E-04	0.58	7.58E-04	0.92	7.21E-04
Cs-137	6.57E+06	14,865	2.80E+07	12,065	913,680	11,472
Eu-152	17	0.047	25	0.038	43	0.036
Eu-154	773	2.1	1,250	1.7	1,978	1.7
Eu-155	123	0.33	244	0.27	321	0.25
I-129	406	8.0	0.57	6.5	7.5	6.1
Ni-63	753,741	14,771	6,437	11,989	5,264	11,400
Np-237	15	0.054	25	0.044	41	0.042
Pu-238	118	2.2	12	1.8	17	1.7
Pu-239	7,519	145	280	117	445	112
Pu-240	1,564	30	69	24	103	23
Pu-241	3,146	61	283	49	397	47
Sn-126	33	0.076	126	0.062	165	0.059
Sr-90	677,789	12,330	93,943	10,008	148,602	9,516
U-233	1.76E-04	6.37E-07	8.36E-05	5.17E-07	1.4	4.92E-07
U-234	15	0.29	0.59	0.23	0.97	0.22
U-235	0.64	0.012	0.025	0.0099	0.041	0.0094
U-236	0.34	0.0065	0.015	0.0053	0.026	0.0050
U-238	15	0.29	0.58	0.24	0.91	0.23

Results of the construction worker radiological RA for six past tank leaks are summarized in Table 3-104. The maximum cumulative ELCR over 1,000 years for each tank leak is compared to the EPA acceptable target risk range of 10^{-4} to 10^{-6}. The results of the assessments showed that at the year of maximum ELCR (year 0), the total cumulative ELCR for all six past tank leaks are greater than EPA's acceptable target risk of 10^{-4}.

Table 3-104. Peak Cancer Risks for the CERCLA Construction Worker Scenario at Waste Management Area C Past Tank Releases (Assuming No Soil Cover).

Exposure Pathway	Route-Specific and Cumulative Risk					
	241-C-101	**241-C-104**	**241-C-105**	**241-C-108**	**241-C-110**	**241-C-112**
External Gamma	3.8E-01	8.7E-04	1.6E+00	7.1E-04	5.4E-02	6.7E-04
Inhalation	7.1E-05	8.8E-07	1.2E-04	7.2E-07	8.2E-06	6.8E-07
Soil Ingestion	3.0E-04	1.7E-06	1.0E-03	1.4E-06	4.6E-05	1.3E-06
Cumulative ELCR	**4E-01**	**9E-04**	**2E+00**	**7E-04**	**5E-02**	**7E-04**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk

Results of the construction worker radiological dose assessment are summarized in Table 3-105. The maximum cumulative dose over 1,000 years for each tank leak is compared to a radiation dose limit of 500 mrem/yr, consistent with DOE M 435.1-1. The results of the assessments showed that the maximum dose for all six past tank leaks are greater than 500 mrem/yr.

Table 3-105. Maximum Radiological Doses for the CERCLA Construction Worker Scenario at Waste Management Area C Past Tank Releases (Assuming No Soil Cover).

Exposure Pathway	Pathway-Specific and Cumulative Dose (mrem/yr)					
	241-C-101	**241-C-104**	**241-C-105**	**241-C-108**	**241-C-110**	**241-C-112**
External Gamma	481,962	1,101	2,051,178	894	67,459	850
Inhalation	327	6	163	5	25	4
Soil Ingestion	403	2	1,352	2	61	2
Cumulative Dose	482,670	1,109	2,052,601	900	67,542	856

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*

3.3.3.2 Supplemental Human Health Risk and Dose Assessment for Surface Releases and 216-C-8 French Drain. Supplemental human health radiological risks are estimated for the soil contamination associated with surface releases and past discharges to the 216-C-8 French drain based on the CERCLA industrial worker exposure scenario, assuming no soil cover. Risk estimates were also calculated for the soil contamination associated with the 216-C-8 French drain assuming a 0.1-m (4-in.) concrete cover is placed over the French drain.

RESRAD Version 7.0 (ANL 2014) was used for performing radiological dose and risk assessments for surface contamination and the 216-C-8 French drain. The area of the contaminated zone for the surface area contamination is assumed to be 55,700 m^2 (RPP-ENV-33418). The area of the contaminated zone for the 216-C-8 French drain is assumed to be 535 m^2.

COPCs for the surface area contamination and the 216-C-8 French drain were identified by applying the same four exclusion criteria, summarized in subsection 3.3.2.1. Radionuclides that met one or more of the criteria were excluded. Radionuclides that did not meet any of the exclusion criteria were carried forward into the RA. Application of the exclusion criteria resulted in the identification of 22 COPCs. It should be noted that nonradiological COPCs were not identified for the surface contamination or French drain.

In absence of sample concentration, the source-term concentrations for those COPCs within the surface area contamination and the 216-C-8 French drain were calculated by utilizing information related to COPC-specific release inventories and the impacted soil mass for those releases. Table 3-106 presents the source-term concentrations for radiological COPCs in surface releases and the 216-C-108 French drain.

The RESRAD code was used to calculate the industrial worker ELCR for both surface contamination and the 216-C-8 French drain over a period of 1,000 years. Results of the industrial worker radiological RA for both surface contamination and the 216-C-8 French drain without a cover are summarized in Table 3-107. The results of the assessments for surface contamination without a cover showed that at the year of maximum ELCR (year 0), the total cumulative ELCR is within EPA's acceptable target risk range of 10^{-4} to 10^{-6}. However, total cumulative ELCR for the 216-C-8 French drain without a cover is greater than EPA's acceptable threshold risk of 10^{-4}. The results further showed that the total cumulative ELCR for the 216-C-8 French drain with a cover is within EPA's acceptable target risk range of 10^{-4} to 10^{-6}.

3.4 UNCERTAINTIES IN RISK ASSESSMENT

The purpose of this RA is to identify exposure areas and COPCs that warrant further evaluation in the CMS. Estimating and evaluating health risk from exposure to environmental contaminants is a complex process with inherent uncertainties. Uncertainty reflects limitations in knowledge, and simplifying assumptions must be made to quantify health risks.

The methodology used in this RA is consistent with EPA RA guidance documents and cleanup procedures for the State of Washington (WAC 173-340). However, due to the many assumptions that must be made about exposure and toxicity, there is uncertainty associated with every RA. Assumptions built into the RA, in general, overestimate rather than underestimate potential risks, but occasionally can result in underestimating risk. Uncertainty is inherent in the selection of input parameters and in every step of the RA process. Risk assessment of contaminated sites must not be viewed as yielding single value, invariant results. Rather, the results of risk assessment are estimates that span a range of possible values, and must be understood only in light of the assumptions and methods used in the evaluation.

Table 3-106. Source-Term Concentrations for Radionuclide Contaminants of Potential Concern in Leak Affected Soil for Surface Releases and 216-C-8 French Drain.

Radionuclide Contaminant of Potential Concern	Source-Term Concentrations (pCi/g)	
	Surface Releases	216-C-8 French Drain
Am-241	0.067	0
C-14	0.016	0
Cm-243	1.66E-08	0
Cm-244	3.43E-07	0
Cs-137	5.5	60
Eu-152	1.74E-05	0
Eu-154	7.86E-04	0
Eu-155	1.20E-04	0
I-129	0.0029	0
Ni-63	5.4	0
Np-237	1.99E-05	0.0075
Pu-238	8.27E-04	0.060
Pu-239	0.053	1.4
Pu-240	0.011	0.36
Pu-241	0.022	1.3
Sn-126	2.81E-05	0
Sr-90	4.5	502
U-233	2.34E-10	5.65E-07
U-234	1.05E-04	0.0040
U-235	4.50E-06	1.67E-04
U-236	2.40E-06	1.02E-04
U-238	1.08E-04	0.0039

The results of the HHRA conducted for WMA C are presented in terms of the potential for adverse effects based upon a number of conservative assumptions. The tendency to be protective is an effort toward ensuring that the results of the assessment are protective of human health. Uncertainty can be found in all phases of the RA: in the analytical data, the exposure assessment, the toxicity assessment, and the risk characterization. Where uncertainty does exist, the HHRA uses conservative assumptions to ensure that the outcome is sufficiently protective. Uncertainties associated with each phase of the HHRA are summarized below.

Table 3-107. Maximum Risk for Surface Area Contamination and 216-C-8 French Drain under a CERCLA Industrial Worker Exposure Scenario.

Exposure Pathway	Surface Contamination	216-C-8 French Drain	
		Baseline Condition	Post-Remediation Condition
External Gamma	3.2E-05	3.4E-04	4.1E-05
Inhalation	3.3E-12	7.9E-12	2.6E-12
Soil Ingestion	5.2E-08	2.1E-06	7.0E-07
Cumulative ELCR	3E-05	**3E-04**	4E-05

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ELCR = excess lifetime cancer risk

3.4.1 Uncertainties Associated with Analytical Data

Uncertainty is introduced to the RA when sample locations are selected and when samples are collected and analyzed. Based on the information obtained from historical site operations and releases, soil samples were collected from areas of potential sources and releases. Current conditions are represented by soil data collected from 13 biased sampling locations within WMA C. Those sampling locations were selected to represent the worst case conditions for the source term. As a result, there is a conservative bias for the source term and associated risk estimates.

Table N-1 of the WMA C RFI includes all primary and duplicate samples collected from various depths within each EA as a part of Phase 2 Site Characterization for WMA C. Among those, a total of 136 primary soil samples were collected at various depths (near surface [0 to 3 ft bgs], shallow surface [0 to 15 ft bgs] and deep [>15 ft bgs]) from 10 EAs within WMA C. Therefore, a sufficient number of samples were collected to adequately characterize the nature and extent of the contamination. To estimate exposure at WMA C, the soil data set from 13 biased sampling locations were divided into 10 exposure units. Soil sampling results from the shallow surface zone (0 to 15 ft bgs) for each EA were then used to determine the source term. In some cases, a limited number of samples (<6) were collected from the shallow surface zone and were used to determine the EPCs. In such cases, the maximum detected sample result was often selected as the EPC rather than a UCL (RPP-RPT-57218). Therefore, use of maximum detected concentration as the EPC resulted in a very conservative overestimation of risk for various EAs.

Two screening approaches were taken during the selection of COPCs in this HHRA (Section 3.2.2). They are summarized below.

- Based on EPA/540/1-89/002, four screens – (1) Data Reduction Screen, (2) Weight-of-evidence screen, (3) Risk screen, and (4) Background screen – are performed during the identification of COPCs. During this HHRA, both risk and background screens were not performed. Therefore, nonradiological and radiological analytes were not eliminated as COPCs based on risk screen.

- According to EPA/540/1-89/002, when chemical constituents are detected in less than 5% of the samples for a given medium, they may be artifacts due to sampling, analytical, or other problems, and may not be related to site activities or disposal practices, and therefore are not included as COPCs. However, chemicals and radionuclides that have been analyzed for and detected in any sample were included during the identification process of COPCs.

Application of two conservative approaches during the selection of COPCs resulted in additional contribution of risks to total risk, and thereby may overestimate the actual risks. Cancer risks and non-cancer hazards presented in the risk characterization include contribution from all COPCs. Additionally, cancer risks and non-cancer hazards in the risk characterization section are overstated because they include the contribution from metals and radionuclides that are less than the Hanford Site background.

Food chain pathways were evaluated for radiological COPCs. They were not evaluated for nonradiological COPCs. By not calculating nonradiological risks for food chain pathways, total site risk is underestimated.

Sampling results for 37 primary and secondary COPCs were reported as not detected at MDLs exceeding target detection limits. The required and target detection limits were, in most instances, risk-based or statistically derived. Some exceedances were attributable to result calculation based on aliquot size used for preparation and analysis. Other exceedances were attributable to sample dilutions needed to alleviate interference from other analytes in the sample (high concentrations, overlapping peaks, etc.) or the sample matrix. A number of exceedances were attributable to the variability in MDLs across laboratories. These exceedances resulted in an uncertainty to the risk calculation.

Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for contaminants. However, due to the presence of extensive amount of interferences caused by buried infrastructure and topographic constraints, a judgmental sampling approach was applied. Statistical analysis may not the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA was performed for five risk scenarios using a sample-by-sample evaluation.

3.4.2 Uncertainties Associated with Exposure Assumptions

Exposure assessment may introduce a considerable amount of uncertainty in the RA process. Exposure assumptions are based on speculation regarding potential land use, contaminant fate and transport, and receptor behavior.

In the RA, long-term exposure concentrations were calculated as upper estimates of site concentrations (e.g., maximum detection or 95% UCL) rather than the sample mean to characterize the site. Calculating UCLs for EPCs (OSWER 9285.6-10) recommends using a 95% UCL on the mean for estimating EPCs. Section 3.2.2 describes the methodology for calculating the EPCs for detected analytes. The initial HHRA was based on a statistical

approach; the maximum detected concentrations were selected as the EPCs for the smaller sample size. However, for the HHRA based on the sample-by-sample approach, soil concentrations from individual sample results are selected as the effective EPCs.

For left-censored data sets with multiple detection limits, the Kaplan-Meier (KM) method generally yields the best estimates of the population mean and standard deviation. For smaller detected samples (<=4), ProUCL 4 does not calculate a 95% UCL based on KM method; therefore, the maximum detected concentration was selected as the EPC. However, ProUCL 5.0 implements a method which can use incremental sampling method replicates, which enables the calculation of UCLs for samples of sizes as small as 3. The 95% UCL results based on 95% KM method are typically less than the corresponding maximum detected concentration. It should be noted that for highly skewed data sets, the 95% UCL results could still exceed the maximum detected concentration. To address this issue, a comparison of the EPC values calculated using both versions of ProUCL (4 and 5) is presented in Appendix G. Table 2 of Appendix G lists the 88 analytes that had different EPCs when ProUCL version 4.00.05 versus version 5.1 was used to determine 95% UCL. The changes are due to the following reasons:

- 27 that were previously assigned Max Detect because of insufficient samples now have 95% UCL values and bases
- 76 of the 88 changed EPCs are smaller than those obtained using ProUCL 4.00.05
- 12 of the 88 changed EPCs are larger than those obtained using ProUCL 4.00.05.

The exposure assumptions used for the three workers (industrial, construction and maintenance/ surveillance), trespasser (adult and youth) and residential receptor (adult and child) exposure scenarios represent an RME. For estimating the RME, 95th percentile values (or upper-bound estimates of national averages) are generally used for exposure assumptions, and exposed populations and exposure scenarios are also selected to represent upper-bound exposures. The intent of the RME, as discussed by the EPA Deputy Administrator and the Risk Assessment Council ("Guidance on Risk Characterization for Risk Managers and Risk Assessors" [EPA 1992]), is to present risks as a range from central tendency to high-end risk (i.e., above the 90th percentile of the population distribution). This descriptor is intended to estimate the risks that are expected to occur in small but definable "high-end" segments of the subject population (EPA 1992). The EPA distinguishes between those scenarios that are possible but highly improbable and those that are conservative but more likely to occur within a population, with the latter being favored in risk assessment. In general, these assumptions are intended to be conservative and yield an overestimate of the true risk or hazard.

Another key area of uncertainty associated with exposure is the bioavailability of the chemicals present in soil and movement of the chemicals into the bloodstream (i.e., dermal penetration and gastrointestinal absorption). Lipophilic chemicals are likely to be present in soil for a long time, and are therefore less bioavailable than the same chemicals freshly added to the soil. The dermal or oral absorption rates for those lipophilic chemicals are much lower. However, the absorption rates used during this RA were based on laboratory testing using freshly added chemicals.

Higher absorption rates were used during the calculation of intake, thus resulting in an overestimation of risk due to intake of chemicals.

The risk from gamma radiation is dependent on the source surface area and thickness. Slope factors for external gamma radiation assume that the source is uniformly contaminated with infinite depth. This geometry may not represent actual conditions, resulting in an overestimate of risk. The radionuclide concentrations are spotty in nature. However, during this RA, radionuclides are assumed to be uniformly contaminated across the thickness of the contaminated zone. This assumption resulted in an overestimation of dose and risk. Uncertainty associated with the exposure assumptions used in this RA is low to moderate, and most likely overestimates the actual risks.

3.4.3 Uncertainties Associated with Toxicity Assessment

The toxicological database was also a source of uncertainty. The EPA has outlined some of the sources of uncertainty as defined in the RA guide (EPA/540/1-89/002) and in the human health toxicity values (Memorandum OSWER Directive 9285.7-53). These sources may include or result from the extrapolation from high to low doses and from animals to humans. This is contingent on the species, gender, age, and strain differences in the uptake, metabolism, organ distribution, and target site susceptibility of a toxin. The variability of the human population with regard to diet, environment, activity patterns, and cultural factors are also sources of uncertainty.

The cancer slope factors in particular are based on studies that may differ greatly from realistic situations. Experimental cancer bioassays typically expose animals to very high levels of chemicals (i.e., the maximum tolerated dose) for their entire lifetime. After appropriate studies have been identified, the slope factor is calculated as the upper 95th percent confidence limit of the slope of the dose-response curve. This introduces conservatism into the RA. In addition, carcinogens are assumed to be human carcinogens regardless of EPA's weight-of-evidence classification.

The derivation of reference doses involves the use of animal studies. Uncertainty factors ranging from 1 to 1,000 are incorporated into the reference dose to provide an extra level of health protection. The factors used depend on the type of study from which the value has been derived (e.g., animal or human, chronic or acute, study design). The scientific basis for this practice is somewhat subjective. In general, high uncertainty factors are meant to bias the results conservatively so that exposures at the reference dose level will not result in adverse health effects.

Traditionally, EPA has developed toxicity criteria for carcinogens by assuming that all carcinogens are nonthreshold contaminants. However, EPA recently has published revised cancer guidelines (EPA/630/P-03/001F, *Guidelines for Carcinogen Risk Assessment*) in which they have modified their former position of assuming nonthreshold action for all carcinogens. This new guidance emphasizes establishing the specific toxicokinetic mode of action that leads to development of cancer. In the future, toxicity criteria for carcinogens in the United States will be developed assuming no threshold for contaminants that exhibit genotoxic modes of action, or

where the mode of action is not known. However, currently-available EPA toxicity criteria for carcinogens were all derived assuming a nonthreshold model.

Throughout most of the world, nonthreshold toxicity criteria are developed only for those carcinogens that appear to cause cancer through a genotoxic mechanism (Toxicology Excellence for Risk Assessment [TERA], Queried 10/2014, [International Toxicity Estimates for Risk], https://iter.ctc.com/publicURL/pub_search_list.cfm). Specifically, for genotoxic contaminants, the cancer dose-response model is based on high-dose to low-dose extrapolation and assumes there is no lower threshold for the initiation of toxic effects. Cancer effects observed at high doses are found in laboratory animals or are extrapolated from occupational or epidemiological studies. Cancer effects observed at low doses are commonly found in environmental exposures. These models are essentially linear at low doses, so no dose is without some risk of cancer.

Toxicity values derived from orally administered dose studies have been converted to absorbed dose toxicity values for use in evaluating the dermal contact pathway. This is considered a more accurate approach than using unadjusted oral toxicity values for the dermal pathway. Uncertainty is introduced in the use of the gastrointestinal absorption factors. Limited information is available on the gastrointestinal absorption of some analytes and many have no information at all. In addition, no adjustments have been made for the medium of exposure (e.g., when the medium of exposure in the Site differs from the medium of exposure assumed by the toxicity value). The uncertainty associated with using the absorbed dose toxicity values for the dermal pathway is moderate and the bias unknown.

An additional area of uncertainty is exposure to multiple chemicals. Toxicological criteria are developed for individual chemicals. Potential interactions between chemicals could occur, leading to uncertainty in the risk estimates for multiple-chemical exposures. The RA assumes that toxicity is additive across chemicals. This assumption would underestimate risk for chemicals that are synergistic or potentiometric with regard to toxicity, and overestimate risk for chemicals that are antagonistic with regard to toxicity. In addition, if chemical toxicological mechanisms differ or affect different organ systems, the assumption of additivity is conservative.

Human health risk assessment was performed for radionuclides, metals, VOCs, SVOCs/polyaromatic hydrocarbons and pesticides/herbicides. Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 11 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature and risk coefficients are available for their radiological isotopes. When they were detected, they were included in the radiological risk assessment. Among 2 VOCs, one was not been detected and the other, (m+p)-Xylene, was detected in 1 of 47 samples with a low concentration (less than 1% of the screening value for the surrogate compound). SVOCs and pesticides were not detected in any sample; as a result, these analytes would not contribute to the total risk.

Cancer and non-cancer risks are summed in the risk characterization process (separately for carcinogens and non-carcinogens) to estimate potential risks associated with the simultaneous exposure to multiple chemicals. In the case of carcinogens, this gives carcinogens with a class B or class C weight-of-evidence the same weight as carcinogens with a class A weight-of-evidence. It also equally weights slope factors derived from animal data with those derived from human

data. Uncertainties in the combined risks are also compounded because RfDs and cancer slope factors do not have equal accuracy or levels of confidence and are not based on the same severity of effect.

3.4.4 Uncertainties Associated with Risk Characterization

Uncertainties in the EPC estimation, exposure assessment, and toxicity assessment affect the degree of confidence in the assessment of risks. If the uncertainty in the EPC is low and the risk-driving chemical is a known human carcinogen (class A), the corresponding uncertainty in the risk characterization is considered low. For cases where the EPC uncertainty is low, but the toxicity criteria are more uncertain, the corresponding uncertainty is considered low to moderate. Finally, if the EPC uncertainty is moderate to high, then the corresponding uncertainty in the risk characterization is considered moderate to high.

Combining the upper bound exposure assumptions, upper bound toxicity assumptions, and upper bound exposure concentrations, as in the RME approach, is a conservative approach typically utilized in risk assessment. This approach assumes, for example, that individuals who are most sensitive to the potential cancer effects of a chemical will also have a breathing rate and exposure duration (e.g., time at one residence) that exceeds most of the population. With numerous upper bound exposure assumptions combined, the risk is typically overestimated for the population. The corollary is that virtually all potentially-exposed individuals will have a much lower level of potential risk than that which is estimated by the conservative assumptions employed in this assessment.

Uncertainties in any phase of the risk analysis are reflected in the risk estimates. Some uncertainty is associated with the summation of risks and HQs for multiple chemical constituents. In the risk characterization, the assumption was made that the total risk of developing cancer from exposure to site contaminants is the sum of the risk attributed to each individual contaminant. Likewise, the potential for the development of non-cancer adverse effects is the sum of the HQs estimated for exposure to each individual contaminant. As stated in EPA/540/1-89/002, “The assumption of dose additivity ignores possible synergisms or antagonisms among chemicals, and assumes similarity in mechanisms of action and metabolism.” However, summing risks and HQs for multiple substances in this RA provides a conservative estimate.

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4.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

A SLERA is a process for evaluating the likelihood that releases of chemicals from contaminated media may adversely affect ecological receptors. The scope of this SLERA is to determine the potential for adverse ecological impacts resulting from exposure to nonradiological and radiological contaminants released to the environment through past site operations related to WMA C. The SLERA provides information that is intended for use to determine: a) whether ecological risks at the site are negligible, b) if further information and evaluation are necessary to better define potential ecological risks at the site, or c) determine if mitigation should be done without further evaluation.

The tiered SLERA for WMA C was prepared primarily in accordance with the framework developed using the tiered process outlined in CHPRC-00784[1], *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*. The framework was based on the steps outlined in EPA 540-R-97-006, *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments: Interim Final*, hereafter referred to as ERAGS, the ecological evaluation procedure presented in WAC 173-340-7490; WAC 173-340-7491, "Exclusions from a Terrestrial Ecological Evaluation"; WAC 173-340-7492, "Simplified Terrestrial Ecological Evaluation Procedures"; and WAC 173-340-7493, "Site-Specific Terrestrial Ecological Evaluation Procedures" and DOE-STD-1153-2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*. This tiered process allows the incorporation of more robust ecological risk assessment (ERA) methods and increasing levels of ecological site-specific and site-relevant information to provide soil screening levels (SSLs) that are more representative of Hanford Site conditions.

A Tier 2 SLERA was also performed by comparing the EPCs for various contaminants at ten EAs within WMA C against background concentrations and nonradiological Tier 2 PRGs for plants, soil invertebrates and wildlife. Tier 2 PRGs for plants and soil invertebrates are presented in ECF-HANFORD-11-0158, *Tier 2 Terrestrial Plant and Invertebrate Preliminary Remediation Goals (PRGs) for Nonradionuclides for Use at the Hanford Site*. Tier 2 PRGs for wildlife are presented in CHPRC-01311, *Tier 2 Risk Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*. Because Tier 2 PRGs are available only for nonradiological contaminants, a Tier 2 SLERA was not performed for radiological contaminants.

The following approach was used for addressing ecological risks potentially associated with both nonradiological and/or radiological contaminants within WMA C.

- Characterization of the Ecological Setting – This section evaluates site ecological settings and the potential for habitat for terrestrial receptors, as well as review of the potential for certain sensitive species for the regional area (see Section 4.1).

- Selection of Contaminants of Potential Ecological Concerns (COPECs) – During this step, COPECs were selected for soil (see Section 4.2). The selection of COPECs utilized

[1] Tier 1 risk-based soil screening concentrations are developed for both radiological and nonradiological constituents.

the soil characterization sampling results collected from 13 judgment sampling locations (A, B, C, E, F, G, H, I, J, L1+L2, P, R, and U) within 10 EAs.

- Tiered Assessments – Tier-based risk assessments were conducted based on the framework presented in CHPRC-00784. Generic screening and Tier 1 screenings were initially performed as a part of the tiered screening risk assessments. An additional Hanford site-specific Tier 2 evaluation was also included during the tier-based risk assessments.

    - Generic Screening (see Section 4.3) – During the generic screen, the maximum detected concentration of each COPEC was divided to its corresponding literature-derived generic levels to calculate HQ. If the HQs for the COPECs were less than 1, those COPECs were not retained for further evaluation. When the HQs for the COPECs were greater than 1, those COPECs were retained for Tier 1 screening.

    - Tier 1 screening (see Section 4.4) – Based on toxicity reference values (TRVs), two types of screening were performed during Tier 1 screening. During the first screen, the maximum detected concentration of each COPEC was compared to its corresponding Tier 1 SSLs based on a NOAEL TRV to calculate an HQ. The COPECs with maximum concentrations less than the NOAEL-based SSLs (i.e., HQ<1) were considered to pose negligible potential risk and therefore, were eliminated from further consideration. COPECs with maximum concentrations equal to or greater than the NOAEL-based SSLs (i.e., HQ>1) were retained for a second screening within Tier 1.

      During this second screen, sampling results for remaining COPECs were next compared with Tier 1 SSLs based on Lowest-Observed-Adverse-Effect-Level (LOAEL) TRVs to calculate an HQ. If the HQs for the COPECs were less than or equal to 1, those COPECs were not retained for further evaluation. When the HQs for the COPECs were greater than 1, the COPECs were retained for further evaluation.

      Tier 2 screening (see Section 4.5) – A Tier 2 SLERA was performed by comparing the EPCs for all nonradiological COPECs at ten EAs within WMA C against background concentrations and nonradiological Tier 2 PRGs for plants, soil invertebrates and wildlife. During this screen, initially, Tier 2 screening values for nonradiological COPECs were derived based on their Tier 2 PRGs for plants, soil invertebrates and wildlife, and corresponding soil background concentrations. Next, the EPCs were compared against Tier 2 screening values to calculate an HQ. If the HQs for the COPECs were less than or equal to 1, those COPECs were not retained. However, if an HQ for any COPEC was greater than 1, the COPEC was retained for further evaluation.

- Summary of SLERA (see Section 4.5) – This section summarizes the evaluation of potential ecological risks within WMA C.

- Supplemental ERA (see Section 4.6) – Two additional ERAs—(1) Supplemental ERA for unplanned releases; and (2) Supplemental ERA for past leaks, surface releases and 216-C-8 French drain—were conducted to support the CMS alternatives evaluation process as documented in RPP-RPT-59379. This section summarizes the methodologies and risks.

- Uncertainty Analysis (see Section 4.7) – This section addresses potential sources of uncertainty in the SLERA and discusses how assumptions used in the analyses may affect the conclusions.

4.1 CHARACTERIZATION OF ECOLOGICAL SETTING

This section summarizes the ecology of the Hanford Site [Section 4.5 of PNNL-6415, *Hanford Site National Environmental Policy Act (NEPA) Characterization*], emphasizing plant and animal activities that may affect exposure pathways. PNNL-6415 details both the terrestrial and aquatic ecology of the Hanford Site and presents extensive listings of plant and animal species. However, this SLERA more broadly considers ecological effects to terrestrial receptors because all WMA C SSTs are located within the Central Plateau and not located near significant aquatic ecological habitat.

As mentioned earlier, WMA C is part of the SST system in the 200 East Area of the Hanford Site, and is one of the first four tank farm areas built at the Hanford Site in 1944. The land area within WMA C consists primarily of undeveloped land within the fenceline of the 200 East Area. Chemical processing facilities, shutdown nuclear reactors, and supporting facilities occupy only about 6% of the Site. Most of the Hanford Site has not experienced tillage or agricultural grazing since the early 1940s.

The Hanford Site is characterized as a shrub-steppe ecosystem that is adapted to the mid-latitude semiarid climate of the region. These ecosystems are typically dominated by a shrub overstory with a grass understory. In the early 1800s, dominant plants in the area were big sagebrush (*Artemisia tridentata*) and an understory consisting of perennial Sandberg's bluegrass (*Poa sandbergii*) and bluebunch wheatgrass (*Pseudoregneria spicata*). Other species included threetip sagebrush, bitterbrush, gray rabbitbrush, spiny hopsage, bluebunch wheatgrass, needle-and-thread grass, Indian rice grass, and prairie June grass.

With the advent of settlement, livestock grazing and agricultural production contributed to colonization by non-native vegetation species that currently dominate portions of the landscape. Although agriculture and livestock production were the primary subsistence activities at the turn of the century, these activities ceased when the Hanford Site was designated in 1943. No farming has occurred on the Hanford Site since the government took control of the Site. The dominant non-native species, cheatgrass, is an aggressive colonizer and has become well established across the Site. Over the past decade, several knapweed species also have become persistent invasive species in areas not dominated by shrubs. Range fires that historically burned through the area during the dry summers eliminated fire-intolerant species (e.g., big sagebrush) and allowed more opportunistic and fire-resistant species to establish. Of the 590 species of

vascular plants recorded for the Hanford Site, approximately 20% are non-native. Wildfires are frequent on the Hanford Site. Three large wildfires in the past two decades have burned over 15% of the site.

Currently, no plant species on the Hanford Site are Federally listed as threatened or endangered under the *Endangered Species Act of 1973*. Plant species listed as threatened or endangered by Washington State include the awned halfchaff sedge (*Lipocarpha aristulata*), grand redstem (*Ammannia robusta*), lowland toothcup (*Rotala ramosior*), and persistent-sepal yellowcress (*Rorippa columbiae*). These plant species are restricted to wetlands in the riparian zone of the Columbia River (PNNL-6415).

Even though wildlife use of the disturbed and developed areas is expected to be reduced as these areas are less attractive and provide fewer of the habitat requirements of wildlife than do more natural habitats, these areas can be frequented by wildlife. Common species include large animals like Rocky Mountain elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*); predators such as coyote (*Canis latrans*), bobcat (*Lynx rufus*), and badger (*Taxidea taxus*); and herbivores including deer mice (*Peromyscus maniculatus*), harvest mice (*Riethrodontonomys megalotis*), ground squirrels (*Spermophilus* spp.), voles (*Lemmiscus curtatus, Microtus* spp.), and black-tailed jackrabbits (*Lepus californicus*). The most abundant mammal on the Hanford Site is the Great Basin pocket mouse (*Perognathus parvus*). Other non-burrowing animals including cottontails (*Sylvilagus nutalli*), jackrabbits, snakes, and burrowing owls (*Athene cunicularia*); the latter which typically use abandoned burrows of other animals.

No species that regularly frequent the Hanford Site are listed as threatened or endangered under the *Endangered Species Act of 1973*. Species listed as threatened or endangered by Washington State include the burrowing owl (*Athene cunicularia*), Merriam's shrew (*Sorex merriami*), and Washington ground squirrel (*Urocitellus washingtoni*). However, none of these species are known or expected to occur onsite because of the highly developed nature of this area.

As mentioned earlier, WMA C is located in the northeast corner of the inner area of the Central Plateau's 200 East Area. The boundary of the inner area is defined by waste disposal decisions already in place and anticipated future decisions that will require continued waste management and containment of residual contamination (DOE/RL-2009-81, *Central Plateau Cleanup Completion Strategy*; DOE/RL-2009-10, *Hanford Site Cleanup Completion Framework*). Future land use for the inner area of the Central Plateau is currently designated as industrial. Public access to the Site is restricted. No food is grown at the Site. The area within WMA C is covered by fill material with a gravel surface. It is actively managed to preclude nuisance colonization by plants and associated communities of organisms. Herbicides and pesticides are used on a regular basis and fences are placed around the perimeter to keep larger animals out. Without a source of food within the WMA, smaller animals are less likely to enter.

4.2 SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN

Two types of screens—(1) initial data reduction and (2) analytical detection—that were used for the HHRA were performed to identify COPECs for each EA. The following sections of the report summarized the screening processes.

4.2.1 Data Reduction Screen

Under data reduction screen, three exclusion criteria were used to identify soil COPECs for each EA. Analytes that met one or more of the exclusion criteria were eliminated. Analytes that did not meet any of the exclusion criteria were carried forward into the next screen. The exclusion criteria include the following.

Criterion 1: Essential Nutrients. Under this screen, the essential nutrients calcium, magnesium, potassium, and sodium were detected in samples in the WMA C but are excluded from further consideration.

Criterion 2: Background Radionuclides. Six naturally-occurring radionuclides associated with background radiation (^{40}K, ^{226}Ra, ^{228}Ra, ^{228}Th, ^{230}Th, and ^{232}Th) were eliminated as soil COPECs.

Criterion 3: Radionuclides with Half-Lives of Less than 3 Years. Radionuclides with half-lives of less than 3 years are eliminated from further consideration as soil COPECs. For WMA C, only 10 of 27 short-lived radionuclides were detected and their concentrations are so low that all of those short-lived radionuclides will produce negligible contribution to total risk. Hence, those short-live radionuclides were eliminated from further consideration for identification of COPECs.

4.2.2 Analytical Detection Screen

Chemicals and radionuclides that were analyzed but not detected in any sample (collected from appropriate locations with adequate detection limits) were eliminated as COPECs. All analytes detected at least once were identified as COPECs.

A list of the analytes that remained as COPECs following both the data reduction and analytical detection screens are presented in Table 4-1.

4.3 GENERIC SCREENING PROCESS

The generic screening process represents the first two steps of the eight-step EPA process presented in ERAGS (EPA 540-R-97-006). During the first step, the most conservative literature-derived generic screening level was identified for each COPEC. Secondly, the maximum detected concentrations for each COPEC within each EA were compared against the literature-derived generic screening level to identify (i) contaminants that pose no potential for

ecological risk and thereby require no further evaluation, and (ii) those contaminants for which additional evaluation may be warranted. The generic screen involves calculating a preliminary (screening level) HQ by dividing the maximum detected concentration of a COPEC by the associated generic screening level, as represented by the following equation:

$$Preliminary\ HQ = \frac{Maximum\ Detected\ Concentration}{Literature\ Derived\ Generic\ Screening\ Level}$$

A chemical was retained as a COPEC and subject to a Tier 1 screening in the SLERA if the preliminary HQ exceeded 1.0.

Table 4-1. Identification of Contaminants of Potential Ecological Concern for Each Exposure Area. (3 sheets)

Contaminants of Potential Ecological Concern	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Nonradiological Contaminants of Potential Concern										
Aluminum	X	X	X	X	X	X	X	X	X	X
Antimony	X	X	X	X	X	X	X	X	X	X
Arsenic	X	X	X	X	X	X	X	X	X	X
Barium	X	X	X	X	X	X	X	X	X	X
Beryllium	—	X	X	X	X	X	X	X	X	X
Boron	—	—	X	—	—	X	—	—	—	X
Cadmium	X	X	X	X	X	X	X	X	X	—
Chromium	X	X	X	X	X	X	X	X	X	X
Cobalt	X	X	X	X	X	X	X	X	X	X
Copper	X	X	X	X	X	X	X	X	X	X
Iron	X	X	X	X	X	X	X	X	X	X
Lead	X	X	—	X	X	X	X	X	X	X
Lithium	X	X	X	X	X	X	X	X	X	X
Iron	X	X	X	X	X	X	X	X	X	X
Lithium	X	X	X	X	X	X	X	X	X	X
Manganese	X	X	X	X	X	X	X	X	X	X
Mercury	—	X	X	X	—	X	X	X	X	X
Molybdenum	—	—	—	—	X	—	X	—	—	X
Nickel	X	X	X	X	X	X	X	X	X	X
Selenium	—	—	X	—	X	—	X	—	X	—

Table 4-1. Identification of Contaminants of Potential Ecological Concern for Each Exposure Area. (3 sheets)

Contaminants of Potential Ecological Concern	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Nonradiological Contaminants of Potential Concern (continued)										
Silver	X	X	X	X	X	X	X	X	X	X
Strontium	X	X	X	X	X	X	X	X	X	X
Thallium	X	X	X	X	X	X	X	X	X	X
Tin	X	—	—	X	—	X	—	X	—	—
Total Uranium	X	X	X	X	X	X	X	X	X	X
Vanadium	X	X	X	X	X	X	X	X	X	X
Zinc	X	X	X	X	X	X	X	X	X	X
Chloride	X	X	X	X	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X	X	X	X	X
Nitrate	X	X	X	X	X	X	X	X	X	X
Nitrite	X	X	X	X	X	X	X	X	X	X
Sulfate	X	X	X	X	X	X	X	X	X	X
Acetone	—	—	X	—	—	—	X	X	X	X
Benzene	—	—	—	—	—	—	—	X	—	X
Bis(2-ethylhexyl) phthalate	—	—	—	X	—	X	—	—	—	—
1-Butanol	—	—	—	—	—	—	X	—	—	—
2-Butanone	—	—	—	X	—	—	—	—	—	—
Butylbenzylphthalate	—	X	X	X	X	X	X	—	X	—
Diethylphthalate	X	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	X	—	—	X	—	—
2-Hexanone	—	—	—	—	—	—	—	—	X	—
Hexane	—	—	—	X	—	—	X	—	—	—
Methylene chloride	—	—	—	X	—	—	—	X	X	—
Toluene	—	—	X	X	X	—	—	X	X	X
o-Xylene	—	—	—	X	—	—	—	—	—	—
Styrene	—	—	—	X	X	—	—	—	—	X
Xylenes (total)	—	—	—	X	—	—	—	—	—	—
Aldrin	—	—	X	—	—	—	—	—	—	—

Table 4-1. Identification of Contaminants of Potential Ecological Concern for Each Exposure Area. (3 sheets)

Contaminants of Potential Ecological Concern	Exposure Areas									
	A + B	C	E	F + G	H + I	J	L1 + L2	P	R	U
Nonradiological Contaminants of Potential Concern (continued)										
beta-BHC	—	—	—	X	—	—	X	X	—	—
Gamma-BHC (Lindane)	—	—	—	X	—	—	—	—	—	—
Aroclor-1254	X	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	—	X	—	—	—	X	—	—
Radiological Contaminants of Potential Concern										
Americium-241	X	—	—	—	—	—	—	X	—	—
Carbon-14	X	—	—	X	X	X	X	—	—	X
Cesium-137	X	X	X	X	—	X	X	X	—	X
Cobalt-60	—	—	—	—	—	—	—	X	—	—
Iodine-129	—	—	—	—	—	—	—	X	—	—
Neptunium-237	—	—	—	—	—	—	—	X	—	X
Nickel-63	—	X	—	—	—	—	X	X	—	—
Plutonium-238	—	—	—	—	—	X	—	—	—	—
Plutonium-239/240	X	—	—	—	—	X	—	X	—	—
Plutonium-241	X	—	—	—	—	X	—	X	—	—
Selenium-79	X	—	X	X	X	X	X	X	—	X
Strontium-90	X	X	X	X	—	X	X	X	X	X
Technetium-99	—	—	—	—	—	—	—	X	—	—
Tin-126	X	X	X	X	X	—	X	—	—	X
Tritium	—	—	—	—	X	—	X	X	X	—
Uranium-233	—	—	X	X	X	—	X	X	X	X
Uranium-234	X	—	X	X	X	—	X	X	X	X
Uranium-235	X	X	X	X	X	X	X	X	X	X
Uranium-236	—	—	X	X	X	—	X	X	—	X
Uranium-238	X	X	X	X	X	X	X	X	X	X

Table 6-1 of CHPRC-00784 presents the literature-published screening values for plants, soil invertebrates, birds, and mammals, Hanford Site background concentration and the

literature-derived generic screening values for 113 of the 137 COPECs considered at the Hanford Site. The literature-derived generic screening levels for COPECs are determined by:

- identifying readily-available screening levels for terrestrial plants, soil invertebrates, birds, and mammals extracted from published regulatory agency and related sources;
- deriving the most conservative (i.e., lowest) screening level for each COPEC from the readily-available values for terrestrial plants, soil invertebrates, birds, and mammals; and
- selecting the higher value for a COPEC between the most conservative screening level and the COPEC's corresponding Hanford Site background concentration.

These readily-available screening values for terrestrial plants, soil invertebrates, birds, and mammals are not specific to the Hanford Site; rather, they represent conservative, literature-based screening values. The generic screening levels were obtained from the following published and recognized sources:

- EPA (Ecological Soil Screening Levels [EcoSSLs]; see ECOTOX Knowledgebase, Queried 07/18/2016, https://cfpub.epa.gov/ecotox/),
- Washington State Department of Ecology (Ecology) (Ecological Indicator Soil Concentrations), found in Ecology Publication No. 94-06, *Model Toxics Control Act Regulation and Statute*, Table 749-3, Ecological Indicator Soil Concentrations (mg/kg) for Protection of Terrestrial Plants and Animals,
- Oak Ridge National Laboratory Screening-Level Benchmarks, and
- DOE Biota Concentration Guides for radionuclides, presented in DOE-STD-1153-2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota.*

Appendix E, Attachment E-1 includes the results of the generic screening for nonradiological COPECs within each EA. Table 4-2 summarizes the results of the generic screenings for EAs with COPEC HQ values>1.

Because the dose from radionuclides is additive, the total contributions of radionuclides were calculated using the sum of the fractions (SOF) method. Under SOF, the maximum detected concentration for each radiological COPEC was divided by its corresponding literature-derived generic level to determine the HQ (contribution of individual radionuclide to total dose). Secondly, the HQs for all radiological COPECs were summed to calculate the SOF (total contributions for all radiological COPECs). For the purposes of this evaluation, the HQs for each radionuclide were summed within each EA to equal an SOF. If the SOF was greater than 1, individual detected radionuclide isotope COPECs were carried forward to the Tier 1 screening evaluation. Appendix E, Attachment E-2 includes the results of generic screening for radiological COPECs within each EA. Table 4-3 summarizes the results of the generic screening for each EA where SOFs for all radiological COPECs are greater than 1.

Table 4-2. Nonradiological Contaminants of Potential Ecological Concern with Hazard Quotient>1 Using Generic Screening Levels.

Exposure Areas	Contaminants of Potential Ecological Concern	Maximum Detected Concentration (mg/kg)	Literature-Derived Generic Soil Screening Level (mg/kg)	Hazard Quotient = Maximum Detected Concentration / Literature-Derived Generic Soil Screening Level
C	Arsenic	21.2	10	2.1
E	Cadmium	3.26	0.81	4.0
F + G	Fluoride	3.29	2.81	1.2
H + I	Chromium	26.8	18.5	1.4
	Lead	11.3	11	1.0
	Nitrate	54.6	52	1.1
	Selenium	1	0.78	1.3
J	Barium	244	132	1.8
	Boron	43.9	3.62	12.1
L1 + L2	Selenium	1.35	0.78	1.7
P	Chromium	21.8	18.5	1.2
	Fluoride	4.76	2.81	1.7
	Vanadium	110	85.1	1.3
	Zinc	305	67.8	4.5
R	Cadmium	3.47	0.81	4.3
	Fluoride	3.53	2.81	1.3
U	Boron	6.42	3.62	1.8
	Selenium	2	0.78	2.6

4.4 TIER 1 SCREENING ASSESSMENT

Tier 1 assessment was performed for COPECs that were retained during the generic screening. Under the Tier 1 screening assessment, the maximum detected concentrations for retained COPECs were compared against Tier 1 SSLs. Because Generic Screening Levels for birds and mammals do not take into account receptors or conditions present at the Hanford Site, they may be overly conservative and, in certain cases, produce concentrations that are below local background concentrations in soil. Therefore, refinements that integrate updated data and associated exposure estimations for bird and mammal receptor species resident at the Hanford Site were developed. These refinements, identified as Tier 1 values for birds and mammals, were calculated for both nonradiological and radiological COPECs. The following sections of the report summarized the determination of Tier 1 SSLs.

Table 4-3. Radiological Contaminants of Potential Ecological Concern with Sum of the Fractions>1 Using Generic Screening Levels.

Exposure Areas	Contaminants of Potential Ecological Concern	Maximum Detected Concentration (pCi/g)	Generic Screening		Sum of the Fractions[2]
			Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value[1]	
A plus B	Am-241	0.18	3.89E+03	4.63E-05	**2.4E+00**
	C-14	3.4	4.76E+03	7.14E-04	
	Cs-137	27.7	2.08E+01	**1.33E+00**	
	Pu-239	0.31	6.11E+03	5.07E-05	
	Pu-241	1.2	Not Available	Not Calculated	
	Se-79	2.7	Not Available	Not Calculated	
	Sn-126	47	Not Available	Not Calculated	
	Sr-90	24	2.25E+01	**1.07E+00**	
	U-234	0.33	5.13E+03	6.43E-05	
	U-235	0.011	2.77E+03	3.97E-06	
	U-238	0.24	1.58E+03	1.52E-04	
P	Am-241	2.2	3.89E+03	5.66E-04	**9.8E+00**
	Co-60	0.83	6.92E+02	1.20E-03	
	Cs-137	73.1	2.08E+01	**3.51E+00**	
	H-3	308	1.74E+05	1.77E-03	
	I-129	0.81	5.67E+03	1.43E-04	
	Ni-63	85	Not Available	Not Calculated	
	Np-237	1.5	3.86E+03	3.89E-04	
	Pu-239	10.7	6.11E+03	1.75E-03	
	Pu-241	39.9	Not Available	Not Calculated	
	Se-79	8.7	Not Available	Not Calculated	
	Sr-90	141	2.25E+01	**6.27E+00**	
	Tc-99	24	4.49E+03	5.35E-03	
	U-233	2.6	4.83E+03	5.38E-04	
	U-234	1.4	5.13E+03	2.73E-04	
	U-235	0.043	2.77E+03	1.55E-05	
	U-238	0.88	1.58E+03	5.57E-04	

[1]Value bolded when ratio is equal to or greater than 1.

[2]Value bolded when Sum of the Fractions is equal to or greater than 1.

4.4.1 Determination of Tier 1 Soil Screening Level

Tier 1 SSLs for plants and soil invertebrates are not developed in CHPRC-00784. Tier 1 SSLs were calculated specifically for bird and mammal species present at the Hanford Site by utilizing Steps 3 to 8 of the EPA process presented in ERAGS (EPA 540-R-97-006). Chapters 3 and 4 of the CHPRC-00784 report presented a detailed description of all of these six steps. The following sections of the report provided a brief summary for each of those steps.

4.4.1.1 Screening Level Problem Formulation. The problem formulation includes the development of an ecological CSM that evaluates potential exposure pathways and identifies the representative species used to assess ecological risk to those and other similar species. A part of problem formulation, Figure 4-1 presents a CSM for Hanford Site terrestrial habitats to establish a relationship between the contaminant sources and transport mechanisms, evaluate potential exposure pathways, and identify the representative species that were used to assess ecological risk. The medium of concern for WMA C is shallow soil. With consideration of the ecological setting, land use, and COPEC release mechanisms known at Hanford Site areas, the following ecological exposure pathways are considered the most plausible: soil and food webs/chains. Terrestrial receptors may potentially be exposed to COPECs in soils through inhalation; direct contact; incidental ingestion during feeding, burrowing, or grooming; and ingestion of contaminated food/prey items. Although methods are available for assessing dermal exposure to humans (EPA/600/8-91/011B, *Dermal Exposure Assessment: Principles and Applications*), data necessary to estimate dermal exposure generally are insufficient for wildlife (EPA/600/R-93/187, *Wildlife Exposure Factors Handbook*). For most wildlife, scales, fur and feathers impede directly dermal contact so the direct contact pathway contributes little to an overall soil dose and is typically considered a minor pathway since preening and grooming behaviors ultimately contribute to an ingestion (oral) exposure pathway. Similarly, methods for inhalation (olfactory) exposure of wildlife are also not well established and the inhalation exposure pathway for dust particles is similarly not a driver for the dose to wildlife as compared to the oral exposure pathway (OSWER Directive 9285.7-55, *Guidance for Developing Ecological Soil Screening Levels*). In cases where high VOC concentrations may be present and a complete inhalation exposure pathway is present (e.g., burrowing animals), an evaluation of risk to receptors via the inhalation pathway may be warranted; in cases where VOCs are expected, site chemicals and pathways of exposure are complete. One possible pathway for inhalation is the potential for volatilization of chemicals and exposure to burrowing animals in subsurface soils (e.g., “Wildlife Ecological Screening Levels for Inhalation of Volatile Organic Chemicals” [Gallegos et al. 2007], “Ecological Risks to Fossorial Vertebrates from Volatile Organic Compounds in Soil” [Carlsen 1996]). However, methods and data necessary to calculate inhalation exposures are poorly developed (EPA/600/R-93/187). “Olfactory Bulb Uptake and Determination of Biotransfer Factors in the California Ground Squirrel (Spermophilus beecheyi) Exposed to Manganese and Cadmium in Environmental Habitats” (Bench et al. 2001) also noted that olfactory bulb uptake in fossorial mammals affords a significant exposure route to manganese and cadmium in soils. However, methods for olfactory exposure and risk characterization are not well established. However, VOCs were not found to be elevated in general for shallow soils on the Hanford Site Central Plateau, including WMA C. In addition, manganese and cadmium are not significant Hanford Site contaminants that needed to be evaluated using such site-specific methods. Therefore, the inhalation pathway was not considered during the development of

SSLs. Accordingly, two soil-based exposure pathways—incidental ingestion of soil and ingestion of contaminated food/prey—were identified as the key exposure pathways for wildlife during the WMA C exposure assessment.

4.4.1.2 Screening-Level Ecological Exposure Assessment. Screening-level ecological exposure assessment involves identification of representative ecological receptors and estimation of chemical intake based on the exposure to COPECs detected in the soil. Figure 4-2 presents a food web model for the Hanford Site terrestrial receptors based upon an understanding of the ecology of the area and caloric energy flow dynamics as documented in WMP-20570, *Central Plateau Terrestrial Ecological Risk Assessment Data Quality Objectives Summary Report – Phase I*.

Previous investigations have identified the following entities and their associated organizational level, for consideration during the ERAs within the terrestrial portion of the Hanford Site:

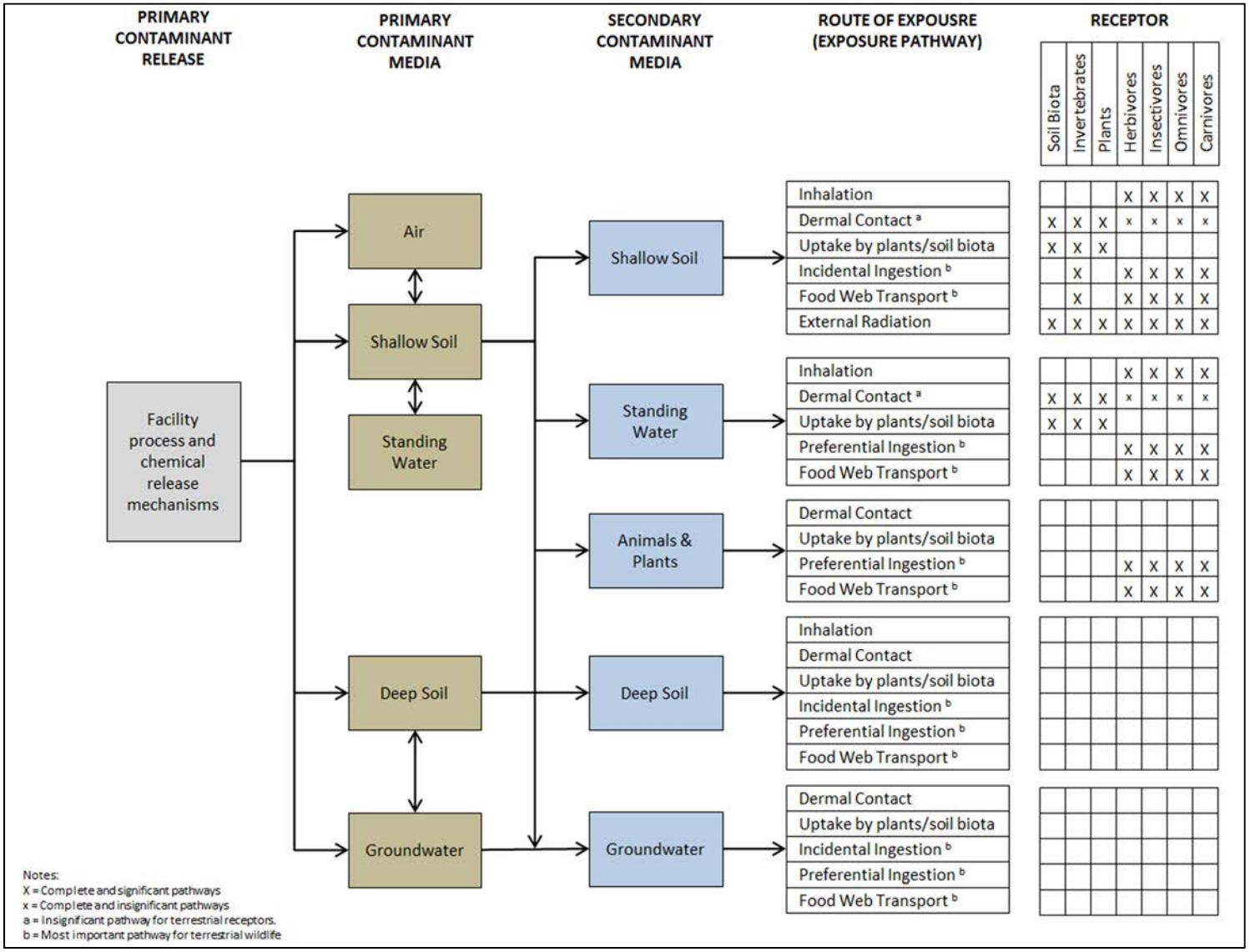
- Terrestrial plants – community level
- Terrestrial invertebrates – community level
- Herbivorous birds – population level
- Herbivorous mammals – population level
- Insectivorous birds – population level
- Insectivorous mammals – population level
- Omnivorous birds – population level
- Omnivorous mammals – population level
- Carnivorous birds – population level
- Carnivorous mammals – population level
- Reptiles and amphibians.[2]

To calculate Tier 1 values, the following representative receptor species common to the terrestrial portion of the Hanford Site were selected for each of the trophic guilds. Consistent with EPA 540-R-97-006, EPA/630/R-95/002F, *Guidelines for Ecological Risk Assessment*, and WAC 173-340-7493, the following factors—species that have ecological relevance, are of societal value, are susceptible to chemical stressors at the site, and allow risk managers to meet policy goals—were used to select representative receptor species:

- Herbivorous birds – California quail (*Callipepla californica*)
- Herbivorous mammals – Great Basin pocket mouse (*Perognathus parvus*)
- Insectivorous birds – killdeer (*Charadrius vociferus*)
- Insectivorous mammals – northern grasshopper mouse (*Onychomys leucogaster*)
- Omnivorous birds – western meadowlark (*Sturnella neglecta*)
- Omnivorous mammals – deer mouse (*Peromyscus maniculatus*)
- Carnivorous birds (raptors) – red-tailed hawk (*Buteo jamaicensis*)
- Carnivorous mammals – badger (*Taxidea taxus*).

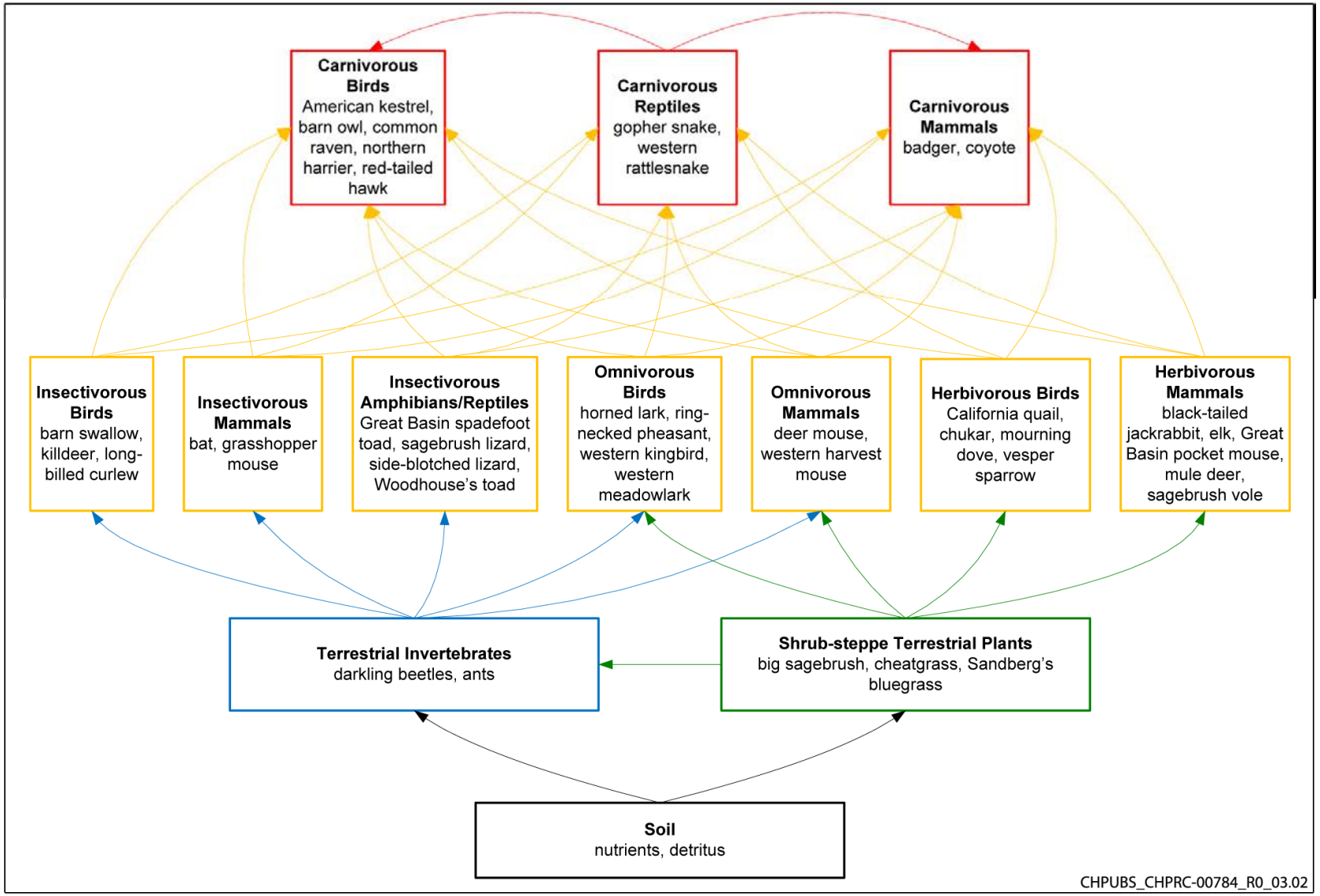
[2] Although part of the food web for the upland environment, effects data for reptiles and amphibians are limited. Therefore, SSLs were not developed for this trophic guild.

Figure 4-1. Conceptual Ecological Conceptual Site Model for Hanford Site Terrestrial Habitats.



Reference: Figure 3-1 in CHPRC-00784, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*.

Figure 4-2. Hanford Site Terrestrial Food Web.



Source: CHPRC-00784, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*.

During the next step, the exposures were calculated based on the intake of soil and food by the representative receptors to the COPECs present in the soil. Section 3.2 of the CHPRC-00784 report presented the methodologies used to quantify nonradiological and radiological intake for birds and mammals. In this SLERA, no actual analytical data exists for chemical concentrations in food from soil. For the purposes of exposure estimation, partitioning of constituents from environmental media to prey was estimated from literature values and models. The models presented in the EPA EcoSSLs methodology [OSWER Directive 9285.7-55, *Guidance for Developing Ecological Soil Screening Levels (Eco SSLs)*, Attachment 4-1, "Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco SSLs"] were used preferentially for estimation of bioaccumulation into biota from soil in Tier 1. Consistent with the approach employed for the EcoSSLs, regression-based models (if available) and median bioaccumulation factors from the source selected by EPA were used. In the absence of applicable bioaccumulation models, a default value of 1 (i.e., soil and tissue concentrations are equal) was assumed (as in the case of boron uptake to small mammals). Table 6-4 of CHPRC-00784 lists the bioaccumulation factors for all contaminants and their sources. The table shows that the bioaccumulation factor values for a number of COPECs are greater than 1. In all cases, it was assumed that tissue uptake occurs under steady-state conditions. Tier 1 screening values for nonradiological COPECs were calculated assuming 100% site use.

Exposure to radionuclides differs from chemical exposure. For the purposes of developing Tier 1 values, radionuclide exposure was estimated based on the internal and external radiation exposure models incorporated into DOE-STD-1153-2002. Tier 1 SSLs for radionuclides utilize more robust Level 3 allometric/kinetic modeling, which is more robust than a Level 2 site screening as documented in DOE Graded Approach. Thus, the Tier 1 values represent more robust exposure evaluation for the site species. Tier 1 values for 22 radionuclides were calculated for eight Hanford representative wildlife species (four bird and four mammal species: California quail, western meadowlark, killdeer, red-tailed hawk, Great Basin pocket mouse, deer mouse, grasshopper mouse, and badger) common to the terrestrial portion of the Hanford Site, based on the modified exposure assumptions. Tier 1 values for radionuclides were calculated assuming 100% site use.

4.4.1.3 Screening-Level Ecological Effects Assessment. Products of the effects assessment are TRVs derived for each stressor-receptor combination. Toxicity reference values are benchmarks, derived from the published literature on toxicological experiments, below which an organism could be exposed without producing an adverse effect. Calculation of Tier 1 values was based exclusively on single chemical toxicity data from literature sources.

For nonradiological COPECs, both NOAEL- and LOAEL-based TRVs for birds and mammals were obtained from various sources and focus was given to the most recent sources and those derived or endorsed by EPA and Ecology. The primary literature source for TRVs was EcoSSLs. Other sources include:

- Other available literature – primarily ES/ER/TM-86/R3, *Toxicological Benchmarks for Wildlife: 1996 Revision*

- NOAEL and LOAEL values selected for chemicals and reported in the EPA IRIS

- NOAEL and LOAEL values presented in Wildlife Toxicity Assessments developed by *Development of Terrestrial Exposure and Bioaccumulation Information for the Army Risk Assessment Modeling System (ARAMS)* (USACHPPM 2004).

MTCA Tables 749-4 and 749-5 requirements do not provide the citations for the exposure factors, bioaccumulation factors, or TRVs, so ecological indicator soil concentrations for wildlife are not readily comparable with wildlife EcoSSLs. Therefore, during the development of Tier 1 SSLs, instead of calculating ecological indicator soil concentrations using parameters listed in Tables 749-4 and 749-5, Hanford-specific exposure factors and bioaccumulation model included in EPA's EcoSSL guidance were used. It should be noted that ecological indicator soil concentrations for plant, soil biota and wildlife presented in WAC 173-340-900, "Tables," Table 749-3 were considered during the development of generic screening levels for COPCs. The screening values for soil biota and wildlife were based on the exposure model provided in Table 749-4 and chemical-specific values provided in Table 749-5.

There are a number of uncertainties associated with literature-based effects data for plants and soil invertebrates. For many constituents, particularly metals, the available LOECs, MATCs, EC10, and EC20 values provide a large range of concentrations, sometimes two or three orders of magnitude. In general, values at the low end of the concentration range also fall within the range of Generic Screening Levels and background concentrations in soil. These two factors create difficulty in selecting a risk-based concentration using a statistic drawn from the available literature data. Use of a lower percentile value, such as 10th or 20th percentile, provides risk-based concentrations that resemble Generic Screening Levels or background concentrations in soil. Values at the high ends of the concentration ranges could create a high bias to central tendency values such as medians or geometric means. Based on these uncertainties, this document did not attempt to select literature-based values for use as Tier 1 risk-based concentrations for plants and soil invertebrates.

Based on guidance from "ICRP Publication 60: Recommendations of the International Commission on Radiological Protection" (ICRP 1991); *Technical Reports Series No. 332, Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards* (IAEA 1992); and *Sources and Effects of Ionizing Radiation* (UNSCEAR 2008), two radiological effect threshold criteria were considered during the development of both generic and Tier 1 SSLs for radiological COPECs:

1. Radiological doses to aquatic animals and to terrestrial plants should not exceed 1.0 rad/day and

2. Radiological doses to terrestrial animals should not exceed 0.1 rad/day.

DOE has adopted these effect thresholds and integrated them into the graded approach (DOE-STD-1153-2002). It should be noted that "Protection of the environment from ionizing radiation in a regulatory context (PROTECT): proposed numerical benchmark values" (Andersson et al. 2009) provided ecological screening values for generic, vertebrates,

invertebrates and plants and they are 10, 2, 200 and 70 µG/hr, or 0.024, 0.0048, 0.48 and 0.168 rad/d, respectively.

For radiological COPECs, more receptor-specific SSLs for wildlife (animals) were developed using *RESRAD-BIOTA for Windows*, Version 1.5 (ANL 2009b) with Level 3 kinetic/allometric modeling assumptions. Values were established for eight species representing feeding guilds at the site. However, Hanford Site-specific tissue residue of radionuclides was insufficient for developing models so values from relevant published literature were used ("Derivation of transfer parameters for use within the ERICA Tool and the default concentration ratios for terrestrial biota" [Beresford et al. 2008]). For example, Beresford et al. (2008) derived transfer factors by extracting data from original literature references. Where desired data necessary for establishing concentration ratios (CRs) were not reported in original publications, Beresford et al. utilized a set of standard assumptions so that the data could be converted to estimate CRs. For a significant number of constituents, the original literature did not provide a basis for establishing CRs and in these instances CRs were developed using (1) a CR for a taxonomically similar organism (2) an available CR for a similar reference organism, (3) a CR value recommended in or derived in previous review articles and (4) use of specific activity models (tritium, ^{14}C).

4.4.1.4 Screening-Level Risk Characterization. The risk characterization step of the SLERA integrates the results of the exposure and toxicity assessments into a quantitative description of excess risks. Risk is not directly evaluated. Instead, exposure and effects data are used to calculate Tier 1 values that represent COPEC concentrations in soil that are associated with minimal likelihood of adverse effects (i.e., risk).

For nonradiological COPECs, Tier 1 values for both birds and mammals were derived by dividing the exposure due to intake of various food items (soil, vegetation, soil invertebrates and small mammals) for each COPEC by its corresponding TRV. As mentioned earlier, TRVs for birds and mammals are derived based on NOAEL and LOAEL. Therefore, Tier 1 screening SSLs were derived based on NOAEL and LOAEL, respectively.

For the purposes of developing Tier 1 values, radionuclide exposure in the wildlife receptor species was estimated based on the internal and external radiation exposure models (the kinetic-allometric modeling methodology) incorporated into DOE-STD-1153-2002. That kinetic-allometric modeling methodology is incorporated into Level 3 of the RESRAD-BIOTA Version 1.5 tool (DOE/EH-0676, *RESRAD BIOTA: A Tool for Implementing a Graded Approach to Biota Dose Evaluation, User's Guide, Version 1*; DOE-STD-1153-2002). Values were established for eight species representing feeding guilds from relevant published literature (Beresford et al. 2008).

Tier 1 values for both nonradiological and radiological COPECs are developed for community level and population level receptors that are common to and representative of the Central Plateau Area. These Tier 1 values are developed using approaches consistent with EPA risk assessment protocols (EPA 910-R-97-005, *EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund*; EPA 540-R-97-006; and EPA/630/R-95/002F) and Ecology

Publication No. 94-06. Table 6-13 of CHPRC-00784 presents the Tier 1 SSLs for both nonradiological and radiological COPECs.

4.4.2 Tier 1 Screening Results

As mentioned in Section 4.0, Tier 1 assessment was performed for COPECs that were retained during the generic screening. Under the Tier 1 assessment, the maximum detected concentrations for retained COPECs were compared against Tier 1 SSLs by calculating a screening level HQ. The HQ was obtained by dividing the maximum detected concentration of the COPEC by the appropriate Tier 1 SSL, as represented by the following equation:

$$HQ = \frac{Maximum\ Detected\ Concentration}{Tier\ 1\ SSL}$$

As mentioned in Section 4.4, two Tier 1 SSLs for each COPEC were derived: one each based on a corresponding NOAEL and LOAEL, respectively. Appendix E, Attachment E-1 also includes the results of Tier 1 screening for nonradiological COPECs. Table 4-4 presents the results of Tier 1 screening for nonradiological COPECs with HQs greater than 1. The results of Tier 1 assessment showed that the HQs for cadmium within EAs E and R and HQs for vanadium and zinc within EA P have HQ values that exceed 1. Those nonradiological COPECs were considered for further evaluation before retaining them.

For radiological COPECs, the maximum detected concentration for each radiological COPEC was divided by its Tier 1 LOAEL-based screening level to determine the HQ and the HQs were then summed for all radiological COPECs to calculate the SOF. If the SOF for an EA was greater than 1, that EA was further considered before retaining the most dominating COPECs.

Appendix E, Attachment E-2 presents the results of Tier 1 screening for radiological COPECs. Table 4-5 summarizes only those results of the Tier 1 screening for radiological COPECs which did not pass the generic screening. The results of Tier 1 assessment for radiological COPECs showed that the SOF for EA P is greater than 1 (2.4). It should be noted that among all radiological COPECs within EA P, more than 99% of the risk is due to ^{90}Sr, ^{3}H and ^{137}Cs. Therefore, those radiological COPECs were considered for further evaluation before retaining them.

4.5 TIER 2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

A Tier 2 SLERA was performed by comparing the soil EPCs for COPECs at ten EAs within WMA C against nonradiological Tier 2 PRGs for plants, soil invertebrates and wildlife, and background concentrations. Tier 2 PRGs are only available for nonradiological COPECs. Hence, the Tier 2 SLERA was performed for nonradiological COPECs only. However, the Tier 1 radiological SSLs are based on more robust ecological exposure assumptions through the use of Level 3 allometric/kinetic data. Therefore, the resulting Tier 1 radiological SSLs (DOE Biota Concentration Guides) are more robust than generic DOE Biota Concentration Guides such

that the lack of Tier 2 SSLs for radiological constituents is not considered a limitation (DOE/EH-0676).

Table 4-4. Results of Tier 1 Screening for Nonradiological Contaminants of Potential Ecological Concern.

Exposure Areas	Analyte	Maximum Detected Concentration (mg/kg)	SSL_{NOAEL} (mg/kg)	Hazard Quotient* = Maximum Detected Concentration / SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	Hazard Quotient* = Maximum Detected Concentration / SSL_{LOAEL}
C	Arsenic	21.20	105	0.20	No Further Evaluation	
E	Cadmium	3.26	0.9	**3.62**	2	**1.6**
F + G	Fluoride	3.29	556	0.01	No Further Evaluation	
H + I	Chromium	26.80	37	0.72	No Further Evaluation	
	Lead	11.30	16	0.71		
	Nitrate	54.60	152,711	0.00		
	Selenium	1.00	1.2	0.83		
J	Barium	244.00	660	0.37	No Further Evaluation	
	Boron	43.90	40	**1.10**	133	0.33
L1 + L2	Selenium	1.35	1.2	**1.13**	2	0.68
P	Chromium	21.80	37	0.59	No Further Evaluation	
	Fluoride	4.76	556	0.01		
	Vanadium	110.00	16	**6.88**	31	**3.5**
	Zinc	305.00	67	**4.55**	68	**4.5**
R	Cadmium	3.47	0.9	**3.86**	2	**1.7**
	Fluoride	3.53	556	0.01	No Further Evaluation	
U	Boron	6.42	40	0.16	No Further Evaluation	
	Selenium	2.00	1.2	**1.67**	2	**1.00**

*Value bolded when Hazard Quotient is greater than 1.

LOAEL = Lowest-Observed-Adverse-Effect-Level
NOAEL = No-Observed-Adverse-Effect-Level
SSL = soil screening level

Published plant and soil invertebrate screening values for aluminum, arsenic, beryllium, boron, chromium, cobalt, lithium, manganese, silver, thallium, tin, uranium and vanadium are the most conservative generic screening values for various organisms. Except for four chemicals—beryllium, silver, thallium, and tin—those published screening values for the other nine chemicals are less than their corresponding background concentrations. Therefore, background concentrations were selected as generic screening values for those nine chemicals. None of the four chemicals were retained during the generic screening. Hence, no screening was performed for plants and soil invertebrates during Tier 1 screening.

Table 4-5. Results of Tier 1 Screening for Radiological Contaminants of Potential Ecological Concern.

Exposure Areas	Contaminants of Potential Ecological Concern	Maximum Detected Concentration (pCi/g)	LOAEL-Based PRG (pCi/g)	Hazard Quotient = Maximum Detected Concentration/ LOAEL-Based PRG	Sum of the Fractions*
A plus B	Am-241	0.18	4840	3.72E-05	4.0E-01
	C-14	3.4	32	1.06E-01	
	Cs-137	27.7	924	3.00E-02	
	Pu-239	0.31	6270	4.94E-05	
	Pu-241	1.2	Not Available	Not Calculated	
	Se-79	2.7	Not Available	Not Calculated	
	Sn-126	47	Not Available	Not Calculated	
	Sr-90	24	91	2.64E-01	
	U-234	0.33	6370	5.18E-05	
	U-235	0.011	4360	2.52E-06	
	U-238	0.24	5150	4.66E-05	
P	Am-241	2.2	4.84E+03	4.55E-04	**2.4E+00**
	Co-60	0.83	805	1.03E-03	
	Cs-137	73.1	9.24E+02	7.91E-02	
	H-3	308	420	7.33E-01	
	I-129	0.81	Not Available	Not Calculated	
	Ni-63	85	Not Available	Not Calculated	
	Np-237	1.5	7880	1.90E-04	
	Pu-239	10.7	6.27E+03	1.71E-03	
	Pu-241	39.9	Not Available	Not Calculated	
	Se-79	8.7	Not Available	Not Calculated	
	Sr-90	141	9.10E+01	1.55E+00	
	Tc-99	24	5360	4.48E-03	
	U-233	2.6	Not Available	Not Calculated	
	U-234	1.4	6370	2.20E-04	
	U-235	0.043	4360	9.86E-06	
	U-238	0.88	5150	1.71E-04	

*Value bolded when Sum of the Fractions is equal to or greater than 1.

LOAEL = Lowest-Observed-Adverse-Effect-Level PRG = preliminary remediation goal

Hanford Site-specific Tier 2 PRGs for plants and soil invertebrates (ECF-HANFORD-11-0158) represent the integration of no observed effect concentrations (NOECs) from the 2011 bioassay study, NOECs from the DOE/RL-2007-21, *River Corridor Baseline Risk Assessment* bioassays, EPA EcoSSLs, area-specific arsenic and lead SSLs for the Tacoma Smelter Plume footprint from Ecology (Ecology Publication No. 11-03-006, *Ecological Soil Screening Levels for Arsenic and Lead in the Tacoma Smelter Plume Footprint and Hanford Site Old Orchards*), uranium SSLs from "Derivation of Ecotoxicity Thresholds for Uranium" (Sheppard et al. 2005), soil ecological indicator concentrations from Ecology (WAC 340-173 Table 749-3), values published by Oak Ridge National Laboratory (ES/ER/TM-85/R3, *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision* and ES/ER/TM-126/R2, *Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision*) and site-specific background. The highest concentration tested (no effects were observed at or below these concentrations) with the lowest uncertainty/highest confidence was identified as the final recommended PRG.

The Tier 2 PRG values for birds and mammals represent Hanford Site-specific values. These values build on the Tier 1 wildlife values in using the same receptors, exposure models, life history parameters, and TRVs used for the Tier 1 values. However, use of bioaccumulation models that reflect a food chain for an arid environment such as the Hanford Site and integration of Hanford Site-specific bioaccumulation data represent the differences between the Tier 1 and Tier 2 values.

4.5.1 Determination of Tier 2 Soil Screening Level

Table 6-3 of ECF-HANFORD-11-0158 Revision 1 presents the recommended soil Tier 2 PRGs for plants and invertebrates. Table 3-1 of CHPRC-01311 summarizes the nonradiological Tier 2 PRGs for Hanford-representative birds and mammals. During the derivation of Tier 2 PRGs for plants and invertebrates, site-specific bioassay-based data and various literature values were evaluated to identify multiple values for each analyte/receptor combination. Among those, the highest NOEC value with the lowest uncertainty/highest confidence was identified as the final recommended PRG. In most cases, these PRGs are based upon the LOAEL, though for some chemicals/metals the PRG is based upon a NOAEL if a LOAEL was not available.

The Tier 2 screening values utilize the same methods as outlined in report CHPRC-00784. Selection of a Tier 2 PRG for a given constituent was performed in the following two steps.

1. Selection of Lowest PRG – The lowest Tier 2 PRG for each COPEC was determined by comparing the individual Tier 2 PRGs for plants, soil invertebrates and wildlife for each constituent.

2. Determination of Tier 2 Screening Value – The Tier 2 screening value for each COPEC was determined by choosing the maximum of either the lowest Tier 2 PRG or its

corresponding site background concentration. Hanford soil background concentrations are obtained from the following sources:

a. DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*

b. ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site*

c. For arsenic, Ecology has chosen to use Method A value of 20 mg/kg for the Hanford Background (Ecology Memorandum 1221558).

Table 4-6 presents the Tier 2 screening values used to conduct the screening of EAs for each nonradiological COPEC.

4.5.2 Tier 2 Screening Level Ecological Risk Assessment Methodology

During Tier 2 SLERA, the EPC of each COPEC at each EA was compared to its corresponding Tier 2 screening value to identify contaminants that pose potential risk to ecological resources and those that pose a negligible risk to ecological resources. COPECs identified as posing a negligible risk to ecological resources require no further evaluation. This determination was made by calculating an HQ, which represents the ratio of the EPC to the Tier 2 screening value (PRG), as represented by the following equation:

$$\mathrm{HQ} = \frac{\mathrm{EPC}}{\text{Tier 2 Screening Value}}$$

If the HQ for a COPEC is less than 1, those COPECs are measured at concentrations below the risk-based screening value and are not retained for further evaluation in the BRA. When an HQ value is greater than 1, then that chemical is retained as a COPEC for more detailed analysis in the BRA.

4.5.3 Results of Tier 2 Screening Level Ecological Risk Assessment

Table 4-7 identifies the results of Tier 2 SLERA within each EA. The results showed that the HQs for six chemicals—boron, molybdenum, selenium, thallium, sulfate and Bis (2-ethylhexyl) phthalate—are greater than 1. Those nonradiological COPECs were considered for further evaluation before retaining them.

Table 4-6. Determination of Tier 2 Screening Values for Nonradiological Contaminant of Potential Ecological Concerns. (2 sheets)

Contaminant of Potential Ecological Concerns	Tier 2 PRGs (mg/kg)			Lowest PRG[1] (mg/kg)	Background Concentration (mg/kg)	Tier 2 Screening Values[2] (mg/kg)
	Plant	Soil Invertebrates	Wildlife			
Aluminum	—	—	3,988	3,988	11,800	11,800
Antimony	842	842	92	92	130	130
Arsenic	128	128	127	127	20	127
Barium	500	358	1,687	358	132	358
Beryllium	10	40	14	10	1.5	10
Boron	29.6	28.6	32	28.6	3.89	28.6
Cadmium	9.84	20	29	9.84	0.563	9.84
Chromium	259	149	109	109	18.5	109
Cobalt	15.7	15.7	484	15.7	15.7	15.7
Copper	70	58	193	58	22	58
Iron	—	—	—	—	32,600	32,600
Lead	9,090	1,700	156	156	10.2	156
Lithium	—	—	1,664	1,664	13.3	1,664
Manganese	1,260	1,260	3,322	1,260	512	1,260
Mercury	0.3	12.5	1.6	0.3	0.013	0.3
Molybdenum	2	28	5.7	2	0.47	2
Nickel	38	280	247	38	19.1	38
Selenium	2.02	4.1	1.4	1.4	0.78	1.4
Silver	560	2.99	983	2.99	0.167	2.99
Strontium	—	—	—	—	—	—
Thallium	1	0.459	6.2	0.46	0.19	0.46
Tin	838	838	84	84	--	84
Total Uranium	250	100	22	22	3.21	22
Vanadium	89.4	116	43	43	85.1	85.1
Zinc	621	8,980	856	621	67.8	621
Chloride	—	—	—	—	100	100
Fluoride	—	—	845	845	2.8	845
Nitrate	—	—	27	27	52	52

Table 4-6. Determination of Tier 2 Screening Values for Nonradiological Contaminant of Potential Ecological Concerns. (2 sheets)

Contaminant of Potential Ecological Concerns	Tier 2 PRGs (mg/kg)			Lowest PRG[1] (mg/kg)	Background Concentration (mg/kg)	Tier 2 Screening Values[2] (mg/kg)
	Plant	Soil Invertebrates	Wildlife			
Nitrite	—	—	27	27	52	52
Sulfate	—	—	—	—	237	237
Acetone	—	—	—	—	—	—
Benzene	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	—	—	0.17	0.17	—	0.17
1-Butanol	—	—	—	—	—	—
2-Butanone	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	—	—
Diethylphthalate	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	—	—
2-Hexanone	—	—	—	—	—	—
Hexane	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—
Toluene	—	—	—	—	—	—
o-Xylene	—	—	—	—	—	—
Styrene	—	—	—	—	—	—
Xylenes (total)	—	—	—	—	—	—
Aldrin	—	—	0.0099	0.0099	—	0.0099
beta-BHC	—	—	0.06	0.06	—	0.06
Gamma-BHC (Lindane)	—	—	—	—	—	—
Aroclor-1254	—	—	—	—	—	—
Aroclor-1260	—	—	—	—	—	—

PRG = preliminary remediation goal
— means no Tier 2 PRGs were derived for that contaminant of potential ecological concern.

[1] Lowest PRG = Minimum of Tier 2 PRGs (Plant, Soil Invertebrates and Wildlife).
[2] Tier 2 Screening Value = Maximum (Lowest PRG, Background Concentration).

Table 4-7. Summary of Soil Benchmark, Source Term Concentrations, Hazard Quotients and Sum of the Fractions Values for Radiological Constituents.

Radiological Contaminant	Tier 1-SSLs* (pCi/g)	Concentration (pCi/g)					HQ = (Concentration/ Tier 1 SSL) (Unitless)				
		UPR-81	UPR-82	UPR-83	Surface	216-C-8	UPR-81	UPR-82	UPR-83	Surface	216-C-8
Am-241	4,840	2,628.2	593.9	195.2	6.7E-02	--	0.5	0.1	<0.1	<0.1	--
C-14	32	518.7	269.4	88.6	1.6E-02	--	**16**	**8**	**3**	<0.1	--
Cm-243	NA	4E-03	0.05	0.02	1.7E-08	--	NC	NC	NC	NC	--
Cm-244	50,800	0.1	0.9	0.3	3.4E-07	--	<0.1	<0.1	<0.1	<0.1	--
Cs-137	924	211,647	45,504,201	14,959,774	5.5	60.4	**229**	**49247**	**16190**	<0.1	<0.1
Eu-152	1,740	1.1	40.7	13.4	1.7E-05	--	<0.1	<0.1	<0.1	<0.1	--
Eu-154	1,610	52.6	2,032.3	668.1	7.9E-04	--	<0.1	**1.3**	0.4	<0.1	--
Eu-155	33,400	10.2	395.9	130.2	1.2E-04	--	<0.1	<0.1	<0.1	<0.1	--
I-129	NA	84.7	0.9	0.3	2.9E-03	--	NC	NC	NC	NC	NC
Ni-63	NA	328,667	10,464	3,440.2	5.4E+00	--	NC	NC	NC	NC	NC
Np-237	7,880	0.6	41.4	13.6	2.0E-05	7.5E-03	<0.1	<0.1	<0.1	<0.1	<0.1
Pu-238	5,980	52.1	19.3	6.3	8.3E-04	6.0E-02	<0.1	<0.1	<0.1	<0.1	<0.1
Pu-239	6,270	2,445.6	455.5	149.8	5.3E-02	1.4E+00	0.4	<0.1	<0.1	<0.1	<0.1
Pu-240	NA	576.7	111.6	36.7	1.1E-02	3.6E-01	NC	NC	NC	NC	NC
Pu-241	NA	2,939.1	700.3	230.2	2.2E-02	1.3E+00	NC	NC	NC	NC	NC
Sn-126	NA	1.0	204.9	67.4	2.8E-05	--	NC	NC	NC	NC	NC
Sr-90	91	177,621	152,725	50,209	4.5E+00	5.0E+02	**1950**	**1676**	**551**	<0.1	**5.5**
U-233	NA	40.2	1.4E-04	4E-05	2.3E-10	5.6E-07	NC	NC	NC	NC	NC
U-234	6,370	5.6	1.0	0.3	1.1E-04	4.0E-03	<0.1	<0.1	<0.1	<0.1	<0.1
U-235	4,360	0.2	4E-02	1E-02	4.5E-06	1.7E-04	<0.1	<0.1	<0.1	<0.1	<0.1
U-236	NA	0.1	2E-02	8E-03	2.4E-06	1.0E-04	NC	NC	NC	NC	NC
U-238	5,150	5.0	0.9	0.3	1.1E-04	3.9E-03	<0.1	<0.1	<0.1	<0.1	<0.1
						Sum of the Fraction	**2196**	**50933**	**16745**	**0.1**	**5.6**

HQ = hazard quotient NA = Not available NC = Not Calculated due to no availability of Tier 1 soil screening levels (SSLs)
-- = inventory not reported and HQ not reported

* Table 6-13 of CHPRC-00784, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*, Rev. 1.

4.6 SUPPLEMENTAL ECOLOGICAL RISK ASSESSMENT

Because of the very high levels of radiological contamination associated with three UPR areas—UPR-81, UPR-82, and UPR-86—soil samples were not collected as part of the original investigation due to safety concerns. In addition, soil samples were not collected for surface contamination located within 241-C Tank Farm or the 216-C-8 French drain. Accordingly, in the absence of sampling data, the WMA C ERA did not evaluate these sites as part of the RA. Therefore, ERAs were performed for three UPRs, surface contamination associated with releases and activities within the 241-C Tank Farm, and the 216-C-8 French drain, located within the WMA C. The assessment is necessary to assess the potential for ecological impacts resulting from biota exposure to nonradiological and radiological COPCs present in the soil affected by the UPRs, surface contamination, and the 216-C-8 French drain. No assessment was performed for six past leak locations as peak leaks occurred at a minimum depth of 20 ft bgs.

Detailed information for the ERAs is documented in RPP-CALC-61128, *WMA C Ecological Risk Assessment for UPRs, Surface Contamination and 216-C-8 French Drain*, Rev. 1 (in Appendix B of RPP-RPT-59379), and RPP-RPT-59379. The following sections of that report briefly summarize the methodologies and results of the risk assessments.

ERAs for three UPRs were performed for both radiological and nonradiological COPCs. Tables 3-98 and Table 3-100 present the source-term concentrations for radiological and nonradiological COPCs used in the supplemental ERA.

For surface contamination evaluations, except for nutrients, the only inventory information available among all nonmobile contaminants is for aluminum. However, the estimated source concentration of 0.24 mg/kg for aluminum is well below the aluminum background concentration of 11,800 mg/kg. For the 216-C-8 French drain, the estimated nonradiological constituent concentrations for aluminum, chromium, iron, lead, nickel and uranium (total) are 250, 1.7, 1.1, 1, 1.6 and 0.3 mg/kg, respectively. However, the background concentrations for these six constituents are 11,800, 18.5, 32,600, 10.2, 19.1 and 3.21, mg/kg respectively. Therefore, only a radiological ERA was performed for surface contamination located within 241-C Tank Farm or the 216-C-8 French drain. Table 3-106 presented the source-term concentrations for radiological COPCs within surface contamination areas and the 216-C-8 French drain.

The ERA for nonradiological and radiological constituents was performed by comparing the estimated source-term concentrations of contaminants (radiological, nonradiological) against corresponding soil benchmarks for ecological receptors. These comparisons result in the identification of constituents that (1) do not pose a potential for ecological risk and require no further evaluation, and (2) may pose ecological risk and require additional evaluation. The ERA involves the calculation of an HQ, which represents an index of risk posed to ecological receptors. The HQ is computed by dividing the concentration of the contaminant in the source exposure media by a soil benchmark, as represented by the following equation:

$$HQ = \frac{Concentration}{Soil\ Benchmark}$$

Soil benchmarks are defined as the higher of either a constituent-specific risk-based concentration protective of ecological receptors or the soil background concentration. For nonradiological contaminants, when an HQ value is less than 1, the concentration is below the soil benchmark and the constituent is deemed to pose a negligible risk and is not retained for further evaluation. HQ values that are greater than 1 indicate a potential for ecological risk and the constituent is retained for further evaluation in the Feasibility Study.

In addition to the calculation of an HQ for radiological contaminants, an SOF is calculated for each area to determine the cumulative risk of all radiological contaminants. The SOF is computed by summing the HQs for each radionuclide to calculate the SOF. If the SOF is greater than 1, unacceptable risk is present for that area and additional site factors that may mitigate (or enhance) the estimated risk are evaluated in the ERA.

For radiological COPCs, Tier 1 LOAEL-based SSLs were selected as the soil benchmark concentrations. For nonradiological COPCs, soil benchmark concentrations were identified in the following two steps.

1. Selection of the Lowest PRG – The lowest PRG for each nonradiological contaminant was determined by comparing the Tier 2 PRGs for plants, soil invertebrates and wildlife.

2. Determination of Soil Benchmark – The SSV for each contaminant was determined by choosing the maximum of either the lowest Tier 2 PRG or its corresponding site background concentration. The following reports document the bases for the Hanford soil background concentrations:

    - DOE/RL-92-24, Vol. 1, Revision 4, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*

    - ECF-HANFORD-11-0038, *Soil Background for Interim Use at The Hanford Site*.

Table 4-7 presents the summary of the source-term concentrations, Tier 1 LOAEL-based SSLs, calculated HQs and SOF for each radiological COPC.

As shown in Table 4-7, the SOFs for the three UPRs and the 216-C-8 French drain are greater than 1 for ^{14}C, ^{137}Cs, ^{154}Eu (UPR-82 only), and ^{90}Sr (major dose contributors). The SOF for surface contamination within 241-C Tank Farm is less than 1, indicating a negligible ecological risk potential. The following should be noted.

1. SSLs and Area Use Factor – The SSLs for all dose-contributing radiological contaminants are derived based on the most sensitive wildlife receptor (a badger), and incorporate an underlying assumption that the area use factor for any given site is 100%. The home range for the badger is considerable at 160 hectares. Considering the three UPRs and the 216-C-8 French drain, the largest area of site contamination is relatively small (0.031 hectares at UPR-82). Accordingly, the fractional area use factor for UPR-82 is 0.0002 (0.031/160). Practically, this means that a badger will utilize only

a small fraction of the site, assuming that the habitat is suitable, for feeding and other activities that result in exposure to contaminants at UPR-82.

2. Existing Use of the Site and Surrounding Areas – The areas within WMA C and the surrounding areas have man-made physical features including buildings, parking lots, paved areas, and maintained landscaping (herbicide use), which significantly reduce potential attractiveness of the UPRs to mobile wildlife receptors. Further, the site is not managed for ecological purposes and there have been no onsite improvements which would create suitable habitat attractive for wildlife receptors.

3. Proposed Post-Remedial Alternative – As mentioned in Section 3.3.2.1, in support of the CMS process, several remedial alternatives such as isolation barriers and/or infiltration barriers are being considered to minimize the risk associated with the elevated radiological contaminants within those UPRs. The remedial alternative proposed is a 3-ft isolation barrier at each UPR. The proposed alternative would prevent the exposure of the radiological contaminant for wildlife receptors.

Table 4-8 presents the summary of the source-term concentrations, soil benchmarks and calculated HQs for nonradiological COPCs at each of the three UPRs (UPR-81, UPR-82 and UPR-86).

Table 4-8. Summary of Source Term Concentrations, Soil Benchmarks and Hazard Quotient Values for Nonradiological Constituents at Unplanned Release Locations.

Nonradiological Contaminants	Soil Concentration (mg/kg)			Soil Benchmarks (mg/kg)	Hazard Quotients		
	UPR-81	UPR-82	UPR-86		UPR-81	UPR-82	UPR-86
Aluminum	8220	--	--	11,800	0.7	--	--
Chromium	77	38	13	109	0.7	0.4	0.1
Iron	51	9	3	32,600	<0.1	<0.1	<0.1
Lead	72	14	4	156	0.5	0.1	<0.1
Mercury	--	0.03	0.01	0.3	--	0.1	<0.1
Nickel	44	10	3	38	**1.1**	0.3	0.1
Uranium (total)	15	3	1	22	0.7	0.1	<0.1

UPR = unplanned release
-- = inventory not reported and Hazard Quotient not reported

As shown in Table 4-8, the HQ for nickel only slightly exceeded its respective Soil Benchmark (i.e., HQ value is slightly greater than 1) at UPR-81 (i.e., indicating a potential for ecological risk), while the HQ values for all other nonradiological constituents at UPR-82 and UPR-86 had HQ values less than 1 (i.e., indicating negligible risk potential). It should be noted that the estimated soil concentration for nickel is higher than its Soil Benchmark, which is based on a Tier 2 PRG for vegetation protection. However, this exceedance is considered of little significance for current and future vegetation exposure because the UPR and surrounding areas

within and around WMA C are paved and any vegetation is (currently) managed using herbicide applications. For soil invertebrates and wildlife, the estimated exposure concentration for nickel is less than the respective Tier 2 PRGs of 280 mg/kg and 247 mg/kg. Therefore, the HQs for nickel estimated for soil invertebrates and wildlife do not indicate a potential for risk for these receptors.

4.7 UNCERTAINTIES ASSOCIATED WITH THE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

There are a number of uncertainties inherent in the analysis tools used for this SLERA and with the screening values that are derived in CHPRC-00784. However, uncertainties must be taken into consideration when interpreting the data presented in the previous sections and when making risk management decisions based on the conclusions of this screening level risk characterization. Section 4 of CHPRC-00784 presented a more detailed description of the uncertainties encountered during the derivation of the generic and Tier 1 SSLs. Similarly, Section 3 of CHPRC-01311 discusses in detail the uncertainties associated with the derivation of the Tier 2 SSLs. These analyses of uncertainty for Tier 1 and 2 screening levels are not reproduced here and the reviewer is encouraged to review the detail in these discussions from the original documents to better understand the limitations associated with the development and use of both types of screening levels. The remainder of this section summarizes the uncertainties associated with the WMA C sampling results used in the SLERA.

Chemicals that were not detected in any samples were not selected as COPECs regardless of their detection limits. A non-detect could occur at any concentration below its detection limit and, possibly, above its screening-level concentration. This presents uncertainties in the ERA in cases where the detection limit of the chemical is greater than its screening-level concentration. These screening-level concentrations were derived to provide very conservative risk screening values. Therefore, these values are often lower than standard method detection limits. Table 8-3 of RPP-RPT-57218 includes all non-detected chemicals and the range of detection limits achieved for each non-detected chemical. A data review was performed to compare the result of the minimum detection limit for each analyte with respect to its corresponding NOAEL- and LOAEL-based Tier 1 SSL. It should be noted that the detection limits for analytes were based on 10% of their ecological SSLs in most cases. The results of the data review showed that except for bis (2-ethylhexyl) phthalate, the minimum detection limit and maximum reporting limit for all non-detect sample results did not exceed their corresponding NOAEL- and LOAEL-based SSL and Tier 2 SSLs.

It has been noted that olfactory bulb uptake in fossorial mammals affords a significant exposure route to manganese and cadmium in soils. However, site-specific methods for olfactory exposure and risk characterization are not well established for manganese and cadmium, and hence, an uncertainty exists.

The quantitative evaluation of chemical concentrations in soil included surface soil from the 0 to 4.6 m (15 ft) depth range. Ecology uses a standard point of compliance in soil of 4.6 m (15 ft) for demonstrating protection of ecological receptors [MTCA; WAC 173-340-7490,

subsection (4) “Point of compliance,” (b) “Standard point of compliance”]. This depth range may overestimate the depth to which many terrestrial receptors would be exposed.

No toxicological data or background values were available for a number of nonradiological and radiological COPECs (acetone, butylbenzylphthalate, diethylphthalate, di-n-butylphthalate, hexane, styrene, gamma-BHC [Lindane], ^{63}Ni, ^{241}Pu, ^{79}Se, ^{126}Sn), or were limited for some COPEC/receptor combinations. Therefore, SSLs could not be developed for all COPECs. In addition, EPA EcoSSLs were not developed for reptiles, amphibians, and soil microbes because EPA concluded that toxicity data for amphibians and reptiles were insufficient for EcoSSL development. The lack of COPEC SSLs may not adequately address risk potential at WMA C

As is often typical, a finite number of samples of environmental media is used to develop the ecological EPC estimates. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are sessile or have limited home ranges) are those based on an estimate of central tendency of chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in EPA/600/R-93/187. It is possible, however, that receptors could spend additional time foraging at a nearby waste site and thus be exposed to analytes from more than one site. Thus, EPC estimates of contaminants in individual waste site media and food sources may not accurately represent contaminant exposure of a receptor ranging into other sites, which is a limitation of the site by site risk assessment approach method utilized. Likewise, the SSLs (Tier 1, 2) incorporate an area use factor of 1 (i.e., assumes 100% of the receptor’s time is spent at one waste site, even if that site is significantly smaller than the receptor’s breeding territory or home range), which will result in a conservative estimate of exposure because offsite foraging would likely be conducted in uncontaminated areas as well. Given the mobility of the upper trophic-level and Hanford representative receptor species, the use of maximum chemical concentrations in the Tier 1 screen as EPCs is conservative.

A major source of uncertainty in the SLERA is associated with the estimation of receptor exposure to COPECs. Generally, the models used to estimate exposures from soil and prey were created to represent a worst-case scenario of possible risks to the receptor groups, and thus, many conservative assumptions were incorporated into the models. For example, the models assume a 100% area use factor. In addition, the bioavailability of chemicals was based on values and models taken from the scientific literature. The COPECs to which receptors are exposed are assumed to be present in their most bioavailable and toxic chemical form found in the environment. Availability and chemical form are affected by factors such as pH, moisture, temperature, microbial activity, and interaction with other chemicals, and in many cases, chemicals are present in less bioavailable/toxic forms in the environment. Given the relatively conservative nature of the toxicity values in terms of chemical bioavailability and form, it is likely that the potential for adverse effects was overestimated.

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5.0 SUMMARY AND CONCLUSIONS

5.1 RESULTS OF HUMAN HEALTH RISK ASSESSMENT

This RA report presents the potential health impacts to human receptors from exposure to both nonradiological and radiological contamination present at WMA C. Past operations at the Site have resulted in releases of chemicals and radionuclides to environmental media that may pose risks to human receptors.

As a part of HHRA, soil sampling results collected from 13 biased sampling locations were validated, evaluated and segregated into 10 EAs. Two screens—data reduction screen and weight of evidence—were performed to identify COPCs for each EA.

Initially, HHRAs were performed for 10 EAs to addresses potential exposures to industrial worker, construction worker, maintenance/surveillance worker, trespasser, hypothetical onsite residential receptors and two Native American residential receptors. The source-term concentrations for both radiological and nonradiological COPCs were calculated using a statistical-based approach. Because judgmental samples were collected from those EAs, additional HHRAs were performed by utilizing sample-by-sample approach source-term concentrations to address potential exposures to CERCLA residential and industrial scenarios for radiological contaminants, and to WAC residential and industrial scenarios for nonradiological contaminants.

During initial HHRA, EPA's RAGS and WAC equations were used to perform risk assessment for nonradiological COPCs. RESRAD (Version 6.5) was used to perform radiological risk assessment to all five receptors for contamination that is present in the soil.

The results of both nonradiological and radiological RAs for each EA were then compared against their corresponding acceptable risk criteria. The acceptable standards or acceptable risk levels have been established by regulatory agencies. For CERCLA receptor scenarios, the total ELCR at each EA is compared with respect to the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. For MTCA receptor scenarios, the total ELCR for each EA is compared with respect to both EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} and the 2013 MTCA cumulative risk threshold of 1×10^{-5}. When the cumulative ELCR for nonradiological analytes exceeds 10^{-5} for the EA, those individual analytes with a risk greater than 10^{-6} are identified as major risk contributors for the residential scenario and those with a risk greater than 10^{-5} are identified as major risk contributors for the industrial scenario. For non-cancer hazard, the HI for each EA is compared with respect to both the EPA and the 2013 MTCA acceptable target HI of 1. When the HI exceeds 1, the chemicals may be segregated by similar mechanisms of action (critical effect) and toxicological effects, and corresponding HQs are summed within a similar mechanism of action and across exposure routes. When the HI based on common mechanism of action and across exposure routes exceeds 1, those chemicals are primary contributors for the exposure area. For radiological COPCs, the total cumulative ELCR for each EA is compared with respect to EPA's acceptable target risk range of 10^{-4} to 10^{-6}. When the total cumulative ELCR exceeds 10^{-4}, those individual COPCs with a risk greater than 10^{-6} are identified as major risk

contributors for the EA. The results of risk characterization for the RME scenarios did not retain any nonradiological COPCs for further evaluation. However, the results retained a number of radiological COPCs for further evaluation. Those are summarized below.

For industrial worker, the total ELCRs for five EAs (A+B, C, E, L1+L2 and P) are greater than the EPA upper risk threshold of 1×10^{-4}. Two major risk contributors, ^{137}Cs and ^{126}Sn, are retained as radiological COPCs for further evaluation.

For maintenance/surveillance worker, the total ELCRs for five EAs (A+B, C, E, L1+L2 and P) are greater than the EPA upper risk threshold of 1×10^{-4}. Two major risk contributors, ^{137}Cs and ^{126}Sn, are retained as radiological COPCs for further evaluation.

For trespasser youth, the total ELCRs for EAs A+B and C are greater than the EPA upper risk threshold of 1×10^{-4}. Two major risk contributors, ^{137}Cs and ^{126}Sn, are retained as radiological COPCs for further evaluation.

For residential receptor, except for EA R, the total ELCRs for all EAs are greater than the EPA upper risk threshold of 1×10^{-4}. Cesium-137, ^{60}Co, ^{63}Ni, ^{79}Se, ^{90}Sr ^{126}Sn and ^{99}Tc were identified as major risk contributors at various EAs. Therefore, they are retained as radiological COPCs for further evaluation.

HHRA was also performed using a sample-by-sample approach for both radiological and nonradiological COPCs. CERCLA industrial worker and CERCLA residential receptor scenarios were considered during the HHRA for radiological COPCs. WAC industrial worker under Method C Standard and WAC residential receptor under Method B Standard were considered during the HHRA for nonradiological COPCs. For carcinogenic COPCs, the results of HHRA for both the statistically- and sample-by-sample-based risk assessment approaches identified the same EAs with ELCRs greater than the EPA upper risk threshold of 1×10^{-4} and the same major risk contributors. For noncarcinogenic COPCs, the results of HHRA for both the statistically- and sample-by-sample-based risk assessment approaches identified the same EAs with HI greater than the EPA acceptable threshold of 1.

In addition, three supplemental HHRAs were conducted to support the CMS alternatives evaluation process. They include: (1) supplemental human health risk assessment for exposure areas; (2) supplemental human health risk assessment for unplanned releases; and (3) supplemental human health risk assessment for past leaks, surface releases and 216-C-8 French drain. Each of them is briefly summarized below.

1. Supplemental Human Health Risk Assessment for Exposure Areas – The HHRA results presented in Section 3.1.5 showed that unacceptable risks are reported for radiological COPCs at five EAs (A+B, C, E, L1+L2 and P). As a result, a 4-in isolation barrier is proposed in the CMS at each EA. Risks to the industrial worker were estimated assuming the implementation of the isolation barrier where the maximum ELCR was within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6}.

2. Supplemental Human Health Risk Assessment for Unplanned Releases – Due to the presence of high levels of radiological contamination at three UPR locations—UPR-81, UPR-82, and UPR-86—samples were not collected and were not included in the RA. Inventories reported in RPP-ENV-33418 were used to estimate source-term concentrations and identify COPCs at each UPR.

   Two types of radiological HHRA were conducted for the CERCLA industrial worker scenario: (1) No soil cover, and (2) a 3-ft concrete cover. The results of HHRA without cover showed that the radiological ELCRs for all UPRs are greater than EPA's acceptable target risk threshold of 10^{-4}. Cs-137 was identified as a major risk contributor (>99% of total risk) for all three UPRs. With a 3-ft concrete cover in place, the radiological ELCRs for all UPRs are within or less than EPA's acceptable target risk range of 10^{-4} to 10^{-6}.

   Nonradiological risk assessment for each UPR was performed for the CERCLA industrial worker and an adult WAC industrial worker receptor scenario based on MTCA Method C Standard. The results of the assessments showed that for carcinogenic COPCs, the total ELCR for all UPRs was less than the EPA's acceptable target risk range of 10^{-4} to 10^{-6} and 2013 MTCA cumulative risk threshold of 1×10^{-5}. Therefore, nonradiological risk contributors were not identified. For noncarcinogenic COPCs, the HI for all UPRs was less than the CERCLA and 2013 MTCA target HI of 1. Therefore, nonradiological non-cancer hazard contributors were not identified.

3. Supplemental Human Health Risk Assessment for Past Leaks, Surface Releases and Floor Drain – Supplemental human health radiological dose and risk assessments were performed for past leaks from six tanks with no soil cover assuming contamination is brought to the surface through excavation activities and existing conditions with 20 ft of soil cover. Because contamination is below the 15 ft bgs point of calculation, the construction worker was evaluated. An industrial worker should not be considered because the direct contact exposure pathway is incomplete.

   Assuming contamination is brought to the surface, the total cumulative ELCRs for all six past tank leaks are greater than the EPA's risk threshold of 10^{-4} and the maximum doses for all six past tank leaks are greater than 500 mrem/yr. When the existing cover is in place, there are no risks associated with exposure to soil because the human health direct contact exposure pathway is incomplete.

   Supplemental human health radiological risks are performed for the soil contamination associated with past discharges to the 216-C-8 French drain and the surface contamination for the CERCLA industrial worker exposure scenario with no soil cover. The total cumulative ELCR for the 216-C-8 French drain is greater than EPA's acceptable risk threshold of 10^{-4}. Therefore, an additional HHRA was estimated for the same CERCLA industrial worker with a 0.1-m (4-in.) concrete cover. The results showed that the total ELCR for the 216-C-8 French drain is within EPA's acceptable target risk range of 10^{-4} to 10^{-6}. The radiological ELCR for surface releases with no soil cover is less than EPA's target risk threshold of 10^{-4}.

Nonradiological risk assessment was not performed for the 216-C-8 French drain and surface contamination. Only aluminum inventory information was available for surface contamination. For the 216-C-8 French drain, the estimated concentrations for nonradiological contaminants were less than 10% of their corresponding background concentrations.

5.2 RESULTS OF GROUNDWATER PROTECTION ANALYSIS

The "protection of groundwater pathway" assessment was performed as part of the WMA C RA to understand the potential impacts to groundwater from migration of nonradiological and radiological contaminants in contaminated soil through the vadose zone to the aquifer. The EPCs for nonradiological contaminants in the vadose zone were evaluated to their corresponding 2013 WAC 173-340-747 three-phase model cleanup levels and 90th percentile background concentration. The results of the evaluations showed that the EPCs for three COPCs (cadmium, beta-BHC and lindane) exceeded their corresponding three-phase model concentrations and background levels at a number of exposure areas.

A "protection of groundwater pathway" assessment was also performed using a sample-by-sample approach. The results of the assessment showed that the individual sample results for five COPCs (arsenic, cadmium, hexavalent chromium, thallium and beta-BHC) exceeded their corresponding soil concentrations protective of groundwater and/or background concentrations. Hexavalent chromium and thallium were not part of the data assessment based on a statistical approach. Hexavalent chromium was not measured during site characterization. The reported sample results for total chromium were assumed to be hexavalent chromium during the sample-by-sample approach data evaluation. A screening level soil concentration based on groundwater protection was used for thallium as the reference dose value for screening purposes only.

5.3 RESULTS OF SCREENING LEVEL ECOLOGICIAL RISK ASSESSMENT

The purpose of this SLERA for WMA C was to determine the potential for adverse ecological impacts resulting from exposure to nonradiological and radiological contaminants released to the environment through past site operations related to WMA C. It was prepared primarily in accordance with the framework developed using the tiered process outlined in CHPRC-00784 and CHPRC-01311.

As a part of the SLERA, data reduction and weight of evidence screenings were performed to identify both nonradiological and radiological COPECs by utilizing the soil characterization sampling results collected from 13 judgment sampling locations (A, B, C, E, F, G, H, I, J, L1+L2, P, R, and U) within 10 EAs.

A three-tiered risk assessment were conducted – Generic Screening, Tier 1 Screening and Tier 2 SLERA. Under the generic screen, the maximum detected concentration of each COPEC was divided by its corresponding literature-derived generic screening levels to calculate HQ. If the

HQs for the COPECs were less than 1, those COPECs were not retained for further evaluation. When the HQs for the COPECs were greater than 1, those COPECs were retained for Tier 1 screening. Table 4-2 presents the results of generic screening for nonradiological COPECs where HQs>1. Table 4-3 presents the results of generic screening for radiological COPECs where SOF>1.

Due to two TRV values (NOAEL and LOAEL) for nonradiological COPECs, two types of Tier 1 SSL values were selected for nonradiological COPECs and therefore, two screens were performed. During the first screen, the maximum detected concentration of each COPEC was compared to its corresponding NOAEL. The COPECs with maximum concentrations equal to or greater than the NOAEL were retained for second Tier 1 screening. During the second screen, the maximum detected sampling results for remaining COPECs were divided by their corresponding LOAEL to calculate HQ. If the HQs for the COPECs are less than 1, those COPECs were not retained for further evaluation. When the HQs for the COPECs are greater than 1, SMDPs were considered before retaining them. Table 4-4 presents the results of Tier 1 screening for nonradiological COPECs. The results of Tier 1 assessment showed that the maximum detected concentrations for cadmium within EAs E and R and HQs for vanadium and zinc within EA P are 2 to 5 times higher their corresponding SSLs based on LOAEL. That means that the HQs for cadmium within EAs E and R and HQs for vanadium and zinc within EA P are greater than 1. For radiological COPECs, Tier 1 SSLs were derived based on their LOAELs. The ratios of maximum detected concentration to SSLs based on LOAELs were summed to calculate the SOF for each EA. Table 4-5 presents the results of Tier 1 screening for radiological COPECs. The results identified a potential for ecological risk at EA P. Among all radiological COPECs, ^{90}Sr, ^{3}H and ^{137}Cs contribute more than 99% of the risk, and are hence considered as radiological COPECs for EA P. Those nonradiological and radiological COPECs were retained for further evaluation.

A Tier 2 SLERA was performed using Tier 2 Screening Values for Plants, Soil Invertebrates and Wildlife to assess the potential for ecological risk resulting from exposure to nonradiological contaminants present in the soil at WMA C. The results of the evaluation showed that the HQs for six COPECs (boron, molybdenum, selenium, thallium, sulfate and Bis [2-ethylhexyl] phthalate) are greater than 1. Those nonradiological COPECs were retained for further evaluation.

Supplemental ERAs were performed for three UPRs, surface contamination associated with releases within the 241-C Tank Farm, and the 216-C-8 French drain, located within WMA C. No assessment was performed for six past leak locations as leaks occurred at a minimum depth of 20 ft bgs; as a result, the ecological exposure pathway is incomplete.

The results of the ERA for radiological contaminants identified potential risk at three UPRs and the 216-C-8 French drain. Carbon-14, ^{137}Cs, ^{154}Eu (UPR-82 only), and ^{90}Sr are identified as major dose contributors. The result also indicated a negligible ecological risk for surface contamination within 241-C Tank Farm. The results of the assessment for nonradiological contaminants showed that the HQ for nickel is greater than 1 at UPR-81, while the HQ values for all other nonradiological constituents at UPR-82 and UPR-86 were less than 1. However, this exceedance is considered of little significance for current vegetation exposure because the UPR

and surrounding areas within and around WMA C are paved and vegetation is currently managed using herbicide applications. The estimated exposure concentration for nickel is less than the respective Tier 2 PRGs of 280 mg/kg and 247 mg/kg for soil invertebrates and wildlife, respectively.

6.0 REFERENCES

11-NWP-053, 2011, "Re: Organic Analyses Optimization for Waste Management Area (WMA) C" (letter from J. J. Lyon to R. W. Lober, U.S. Department of Energy, Office of River Protection, June 1), State of Washington Department of Ecology, Richland, Washington.

11-TPD-020, 2011, "Organic Analyses Optimization for Waste Management Area (WMA) C" (letter from T. W. Fletcher to J. J. Lyon, State of Washington Department of Ecology, March 23), U.S. Department of Energy, Office of River Protection, Richland, Washington.

16-NWP-130, 2016, "Re: 200-SW-2 Radioactive Landfills Group Operable Unit RCRA Facility Investigation/Corrective Measures Study/Remedial Investigation/Feasibility Study Work Plan, DOE/RL-2004-60, Revision 1" (letter from P. E. Eberlein to R. Corey, Richland Operations Office, U.S. Department of Energy, July 27), State of Washington Department of Ecology, Richland, Washington.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," Subpart E—Hazardous Substance Response, §300.430, "Remedial investigation/feasibility study and selection of remedy," *Code of Federal Regulations*, as amended.

64 FR 61615, 1999, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)," *Federal Register*, Vol. 64, pp. 61615–61625 (November 12).

1221558, 2013, "Issues Associated with Establishing Soil Cleanup Levels for Arsenic" (memorandum from D. Bradley to J. A. Hedges and J. Price, Nuclear Waste Program, June 11), Toxics Cleanup Program, State of Washington Department of Ecology, Olympia, Washington.

Andersson, P., J. Garnier-Laplace, N. A. Beresford, D. Copplestone, B. J. Howard, P. Howe, D. Oughton, P. Whitehouse, 2009, "Protection of the environment from ionising radiation in a regulatory context (PROTECT): proposed numerical benchmark values," *Journal of Environmental Radioactivity*, Vol. 100, Issue 12, pp. 1100–1108.

ANL, 2009a, *RESRAD*, Version 6.5, Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.

ANL, 2009b, *RESRAD-BIOTA for Windows*, Version 1.5, Argonne National Laboratory, Argonne, Illinois.

ANL, 2014, RESRAD, Version 7.0, Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.

ATSDR, 2007, *Toxicological Profile for Lead (Update)*, Public Health Service, Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services, Atlanta, Georgia.

Bench, G., T. M. Carlsen, P. G. Grant, J. S. Wollett Jr., R. E. Martinelli, J. L. Lewis, and K. K. Divine, 2001, "Olfactory Bulb Uptake and Determination of Biotransfer Factors in the California Ground Squirrel (Spermophilus beecheyi) Exposed to Manganese and Cadmium in Environmental Habitats," *Environmental Science and Technology*, Vol. 35, No. 2, pp. 270–277.

Beresford, N. A., C. L. Barnett, B. J. Howard, W. A. Scott, J. E. Brown, D. Copplestone, 2008, "Derivation of transfer parameters for use within the ERICA Tool and the default concentration ratios for terrestrial biota," *Journal of Environmental Radioactivity*, Vol. 99, pp. 1393–1407.

Carlsen, T. M., 1996, "Ecological Risks to Fossorial Vertebrates from Volatile Organic Compounds in Soil," *Risk Analysis*, Vol. 16, No. 2, pp. 211–219.

CHPRC-00784, 2014, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*, Rev. 1, CH2M HILL Plateau Remediation Company, Richland, Washington.

CHPRC-01311, 2014, *Tier 2 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*, Rev. 2, CH2M HILL Plateau Remediation Company, Richland, Washington.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Public Law 96-510, 94 Stat. 2767, 42 USC 9601 et seq.

DOE/EH-0676, 2004, *RESRAD-BIOTA: A Tool for Implementing a Graded Approach to Biota Dose Evaluation, User's Guide, Version 1*, ISCORS Technical Report 2004-02, Interagency Steering Committee on Radiation Standards, U.S. Department of Energy, Washington, D.C.

DOE/EIS-0222-F, 1999, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/EIS-0222-SA-01, 2008, *Hanford Comprehensive Land-Use Plan Environmental Impact Statement Supplement Analysis*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/EIS-0391, 2012, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*, U.S. Department of Energy, Washington, D.C.

DOE M 435.1-1, 1999, *Radioactive Waste Management Manual*, U.S. Department of Energy, Washington, D.C.

DOE O 435.1, 2001, *Radioactive Waste Management*, U.S. Department of Energy, Washington, D.C.

DOE/RL-92-24, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 4, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2004-60, 2016, *200-SW-2 Radioactive Landfills Group Operable Unit RCRA Facility Investigation/Corrective Measures Study/Remedial Investigation/Feasibility Study Work Plan*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2007-21, 2012, *River Corridor Baseline Risk Assessment*, Rev. 0, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2009-10, 2013, *Hanford Site Cleanup Completion Framework*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2009-81, 2009, *Central Plateau Cleanup Completion Strategy*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2009-127, 2018, *Remedial Investigation Report 200-BP-5 Groundwater Operable Unit*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2010-49, 2016, *Remedial Investigation/Feasibility Study Work Plan for the 200-WA-1 and 200-BC-1 Operable Unit*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2011-102, 2016, *Remedial Investigation/Feasibility Study and RCRA Facility Investigation/Corrective Measures Study Work Plan for the 200-DV-1 Operable Unit*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2018-69, 2019, *Cumulative Impact Evaluation Technical Approach Document*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-STD-1153-2002, 2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, DOE Technical Standard, U.S. Department of Energy, Washington, D.C.

ECF-HANFORD-10-0442, 2019, *Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area*, Rev. 3, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-Hanford-10-0444, 2018, *Documentation of Standard Method B Soil Cleanup Levels for Unrestricted Land Use*, Rev. 4, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-Hanford-10-0453, 2018, *Calculation of Standard Method C Direct Contact Soil Cleanup Levels for Industrial Land Use for the 100 Areas and 300 Area Remedial Investigation/ Feasibility Study Reports*, Rev. 3, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-HANFORD-11-0038, 2012, *Soil Background for Interim Use at the Hanford Site*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-HANFORD-11-0158, 2014, *Tier 2 Terrestrial Plant and Invertebrate Preliminary Remediation Goals (PRGs) for Nonradionuclides for Use at the Hanford Site*, Rev. 1, CH2M HILL Plateau Remediation Company, Richland, Washington.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order – Tri-Party Agreement*, 2 vols., as amended, State of Washington Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Ecology Publication No. 11-03-006, 2011, *Ecological Soil Screening Levels for Arsenic and Lead in the Tacoma Smelter Plume Footprint and Hanford Site Old Orchards*, Toxics Studies Unit, Environmental Assessment Program, Washington State Department of Ecology, Olympia, Washington.

Ecology Publication No. 94-06, Revised 2013, *Model Toxics Control Act Regulation and Statute*, Washington State Department of Ecology Toxics Cleanup Program, Olympia, Washington.

Endangered Species Act of 1973, 16 USC 1531, et seq., as amended.

EPA, 1992, "Guidance on Risk Characterization for Risk Managers and Risk Assessors" (Memorandum from F. H. Habicht to Assistant Administrators, Regional Administrators, February 26), U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2007, "Method 6010C, Inductively Coupled Plasma-Atomic Emission Spectrometry," Rev. 3. *Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods*, EPA SW-846, Third Ed., 6000 series, pp. 6010C-1 – 6010C-34. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA/240/B-06/002, 2006, *Data Quality Assessment: A Reviewer's Guide EPA QA/G-9R*, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, D.C.

EPA/240/B-06/003, 2006, *Data Quality Assessment: Statistical Methods for Practitioners EPA QA/G-9S*, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, D.C.

EPA 402-R-99-001, 1999, *Federal Guidance Report No. 13, Cancer Risk Coefficients for Environmental Exposure to Radionuclides*, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C.

EPA530-R-05-006, 2005, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities Final*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA/540/1-89/002, 1989, *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A) Interim Final*, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA/540-R-00-007, 2000, *Soil Screening Guidance for Radionuclides: User's Guide*, OSWER Directive 9355.4-16A, Office of Radiation and Indoor Air, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA 540-R-01-003, 2002, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, OSWER 9285.7-41, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA-540-R-03-001, 2003, *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil*, Technical Review Workgroup for Lead, U.S. Environmental Protection Agency, Washington, D.C.

EPA/540/R-92/003, 1991, *Risk Assessment Guidance for Superfund: Volume I – Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals) Interim*, Publication 9285.7-01B, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

EPA 540-R-97-006, 1997, *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments Interim Final*, OSWER 9285.7-25, Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA 540-R-97-036, 1997, *Health Effects Assessment Summary Tables: FY 1997 Update*, Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA/540/R-99/005, 2004, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final*, OSWER 9285.7-02EP, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, D.C.

EPA/600/8-91/011B, 1992, *Dermal Exposure Assessment: Principles and Applications*, Office of Health and Environmental Assessment, U.S. Environmental Protection Agency, Washington, D.C.

EPA/600/R-090/052F, 2011, *Exposure Factors Handbook: 2011 Edition*, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

EPA/600/R-93/187, 1993, *Wildlife Exposure Factors Handbook*, 2 vols., Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

EPA-600/R-94/111, 1994, *Methods for the Determination of Metals in Environmental Samples, Supplement 1*, Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry," Environmental Monitoring Systems Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA/630/P-03/001F, 2005, *Guidelines for Carcinogen Risk Assessment*, Risk Assessment Forum, U.S. Environmental Protection Agency, Washington, D.C.

EPA/630/R-00/004, 1986, *Guidelines for Carcinogen Risk Assessment*, Risk Assessment Forum, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.

EPA/630/R-95/002F, 1998, *Guidelines for Ecological Risk Assessment*, Risk Assessment Forum, U.S. Environmental Protection Agency, Washington, D.C.

EPA/690/R-12/029F, 2012, *Provisional Peer-Reviewed Toxicity Values for Thallium and Compounds*, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA 910-R-97-005, 1997, *EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund*, U.S. Environmental Protection Agency Region 10, Office of Environmental Assessment Risk Evaluation Unit, Seattle, Washington.

EPA 9285.7-42, 2007, *User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows®*, 540-K-01-005, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, D.C.

EPA Eco-SSLs, Ecological Soil Screening Levels, updated in 2006 and 2007. Contaminant-specific documents are available at ECOTOX Knowledgebase, Queried 07/18/2016, https://cfpub.epa.gov/ecotox/.

ES/ER/TM-85/R3, 1997, *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision*, Lockheed Martin Energy Systems, Inc., Oak Ridge, Tennessee.

ES/ER/TM-86/R3, 1996, *Toxicological Benchmarks for Wildlife: 1996 Revision*, Lockheed Martin Energy Systems, Inc., Oak Ridge, Tennessee.

ES/ER/TM-126/R2, 1997, *Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision*, Lockheed Martin Energy Systems, Inc., Oak Ridge, Tennessee.

Gallegos, P., J. Lutz, J. T. Markwiese, R. T. Ryti, and R. Mirenda, 2007, "Wildlife Ecological Screening Levels for Inhalation of Volatile Organic Chemicals," *Environmental Toxicology and Chemistry*, Vol. 26, Issue 6, pp. 1299–1303.

Harris, S. G. and B. L. Harper, 2004, *Exposure Scenario for CTUIR Traditional Subsistence Lifeways*, Confederated Tribes of the Umatilla Indian Reservation, Department of Science and Engineering, Pendleton, Oregon.

HFSUWG, 1992, "The Future for Hanford: Uses and Cleanup, The Final Report of the Hanford Future Site Uses Working Group," Hanford Future Site Uses Working Group, Westinghouse Hanford Company, Richland, Washington.

IAEA, 1992, *Technical Reports Series No. 332, Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards*, International Atomic Energy Agency, Vienna, Austria.

ICRP, 1991, "ICRP Publication 60: 1990 Recommendations of the International Commission on Radiological Protection," *Annals of the ICRP*, International Commission on Radiation Protection, Vol. 21, No. 1-3, pp. 1–202.

IAMIT Determination 2019-006, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Judgmental Sample Analysis*, Hanford Federal Facility Agreement and Consent Order Interagency Management Integration Team, Richland, Washington.

National Environmental Policy Act of 1969, 42 USC 4321-4347, et seq.

OSWER 9285.6-10, 2002, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER 9355.4-24, 2002, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Directive 9200.1-120, 2014, "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factor" (Memorandum from D. Stalcup to Superfund National Policy Managers, Regions 1 - 10, February 6), Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Directive 9285.6-03, 1991, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors" Interim Final*, Office of Emergency and Remedial Response, Toxics Integration Branch, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Directive 9285.7-53, 2003, "Human Health Toxicity Values in Superfund Risk Assessments" (Memorandum from M. B. Cook to Superfund National Policy Managers, Regions 1 - 10, December 5), Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Directive 9285.7-55, 2005, *Guidance for Developing Ecological Soil Screening Levels*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

OSWER Directive 9285.7-55, 2007, *Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs)*, Attachment 4-1, "Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs," U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

OSWER Directive 9355.0-30, 1991, "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions" (internal memorandum from D. R. Clay to EPA Directors, April 22), Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Publication 9285.7-08I, 1992, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

PNNL-6415, 2007, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, Rev. 18, Pacific Northwest National Laboratory, Richland, Washington.

RCW 70.105D, "Hazardous Waste Cleanup — Model Toxics Control Act," *Revised Code of Washington*, as amended.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq.

Regional Screening Levels for Chemical Contaminants at Superfund Sites, Queried 11/2014, [Regional Screening Table], http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/.

Ridolfi, Inc., 2007, "Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington," prepared for the Yakama Nation ERWM Program, Toppenish, Washington.

RPP-CALC-61128, 2016, *WMA C Ecological Risk Assessment for UPRs, Surface Contamination and 216-C-8 French Drain*, Rev. 1, INTERA, Inc. prepared for Washington River Protection Solutions, LLC, Richland, Washington.

RPP-ENV-33418, 2016, *Hanford C-Farm Leak Inventory Assessments Report*, Rev. 4, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-ENV-58782, 2016, *Performance Assessment of Waste Management Area C, Hanford Site, Washington*, Rev. 1, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-PLAN-38777, 2012, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 3, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-PLAN-39114, 2012, *Phase 2 RCRA Facility Investigation/Corrective Measures Study Work Plan for Waste Management Area C*, Rev. 2, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-38152, 2008, *Data Quality Objectives Report Phase 2 Characterization for Waste Management Area C RCRA Field Investigation/Corrective Measures Study*, Rev. 0, Cenibark International, Inc., Richland, Washington.

RPP-RPT-47479, 2011, *Exposure Scenarios for the Waste Management Area C Performance Assessment*, Rev. 1, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-57218, 2014, *Computation of Exposure Point Concentrations for Waste Management Area C Phase 2 Soil Characterization Data*, Rev. 0, INTERA, Inc./Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-58339, 2016, *Phase 2 RCRA Facility Investigation Report for Waste Management Area C*, Rev. 0, Washington River Protection Solutions, LLC/Freestone Environmental, Inc./TerraGraphics Environmental Engineering, Inc., Richland, Washington.

RPP-RPT-59197, 2016, *Analysis of Past Tank Waste Leaks and Losses in the Vicinity of Waste Management Area C at the Hanford Site, Southeast Washington*, Rev. 1, INTERA, Inc./CH2M HILL Plateau Remediation Company/Ramboll Environ, Inc/Washington River Protection Solutions, LLC/TecGeo, Inc., Richland, Washington.

RPP-RPT-59379, 2016, *Waste Management Area C Phase 2 Corrective Measures Study Report*, Rev. 0, Washington River Protection Solutions, LLC/Freestone Environmental Services, Inc./Columbia-Energy and Environmental Services, Inc., Richland, Washington.

Sheppard, S. C., M. I. Sheppard, M. Gallerand, and B. Sanipelli, 2005, "Derivation of Ecotoxicity Thresholds for Uranium," *Journal of Environmental Radioactivity*, Vol. 79, Issue 1, pp. 55–83.

Stern, A. H., 2009, "Derivation of Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate," Division of Science, Research and Technology, New Jersey Department of Environmental Protection, Trenton, New Jersey.

The Risk Assessment Information System, Queried 10/2014, http://rais.ornl.gov/.

Toxicology Excellence for Risk Assessment (TERA), Queried 10/2014, [International Toxicity Estimates for Risk], https://iter.ctc.com/publicURL/pub_search_list.cfm.

UNSCEAR, 2008, *Sources and Effects of Ionizing Radiation*, United Nations Scientific Committee on the Effect of Atomic Radiation, United Nations, New York.

USACHPPM, 2004, *Development of Terrestrial Exposure and Bioaccumulation Information for the Army Risk Assessment Modeling System (ARAMS)*, U.S. Army Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, Maryland.

WAC 173-340, "Model Toxics Control Act—Cleanup," *Washington Administrative Code*, as amended.

WAC 173-340-700, "Overview of Cleanup Standards," Washington Administrative Code, as amended.

WAC 173-340-708, "Human Health Risk Assessment Procedures," *Washington Administrative Code*, as amended.

WAC 173-340-720, "Groundwater Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-740, "Unrestricted Land Use Soil Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties," *Washington Administrative Code*, as amended.

WAC 173-340-747, "Deriving Soil Concentrations for Groundwater Protection," *Washington Administrative Code*, as amended.

WAC 173-340-750, "Cleanup Standards to Protect Air Quality," *Washington Administrative Code*, as amended.

WAC 173-340-900, "Tables," *Washington Administrative Code*, as amended.

WAC 173-340-7490, "Terrestrial Ecological Evaluation Procedures," *Washington Administrative Code*, as amended.

WAC 173-340-7491, "Exclusions from a Terrestrial Ecological Evaluation," *Washington Administrative Code*, as amended.

WAC 173-340-7492, "Simplified Terrestrial Ecological Evaluation Procedures," *Washington Administrative Code*, as amended.

WAC 173-340-7493, "Site-Specific Terrestrial Ecological Evaluation Procedures," *Washington Administrative Code*, as amended.

WMP-20570, 2006, *Central Plateau Terrestrial Ecological Risk Assessment Data Quality Objectives Summary Report – Phase I*, Rev. 0, Fluor Hanford, Richland, Washington.

APPENDIX A

ASSIGNED VALUES FOR EXPOSURE PARAMETERS

Table of Contents

Attachment A-1: Assigned Values for Exposure Parameters during Nonradiological Risk Assessment A-1

Table A-1-1: Assigned Values for Exposure Parameters used in Chemical Risk Assessment A-2

Table A-1-2: Default Values for Exposure Parameters used in MTCA Method B Standard A-4

Table A-1-3: Default Values for Exposure Parameters used in MTCA Method C Standards A-5

Attachment A-2: Assigned Values for Exposure Parameters Used In RESRAD Model A-6

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters A-7

Table A-2-2: Radionuclide-specific Distribution Coefficients (Kd) A-14

Calculation of Assigned Values for Intake Parameters – Residential Receptor Scenario A-15

Calculation of Assigned Values for Intake Parameters – Yakama Nation Resident Scenario A-20

References A-22

ATTACHMENT A-1

ASSIGNED VALUES FOR EXPOSURE PARAMETERS DURING NONRADIOLOGICAL RISK ASSESSMENT

TABLE A-1-1: Assigned Values for Exposure Parameters used in Chemical Risk Assessment

Parameter	Units	Resident	Industrial Worker	Maintenance /Surveillance Worker	Construction Worker	Trespasser Adult	Trespasser Youth	CTUIR Resident	Yakama Resident
General Information									
Exposure frequency	days/year	350[1]	250[1]	136	30	16	72	365[6]	365[7]
Exposure duration	years								
Child		6[1]	NA	NA	NA	NA	7	6[6]	6[7]
Adult		20[1]	25[1]	25[3]	1	24	NA	64[6]	64[7]
Exposure Time	hrs/day	24	8[1]	8	8	8	8	24[6]	24[7]
Body Weight	kg								
Child		15[1]	NA	NA	NA	NA	50[5]	15	15
Adult		80[1]	80[1]	70[4]	70[4]	70[3]	NA	70[6]	70
Carcinogenic averaging time	days	25,550[2]	25,550[2]	25,550[2]	25,550[2]	25,550[2]	25,550[2]	25,550[2]	25,550[2]
Noncarcinogenic averaging time	days								
Child		2,190[2]	NA	NA	NA	NA	2,555[2]	2,190[2]	2,190[2]
Adult		7,300[2]	9125[2]	9125[2]	365[2]	8,760[2]	NA	23,360[2]	23,360[2]
Soil Ingestion									
Soil ingestion rate	mg/day								
Child		200[1]	NA	NA	NA	NA	100[4]	400[6]	400[7]
Adult		100[1]	50[1]	100[4]	330[4]	100[4]	NA	400[6]	200[7]
Inhalation of Dust and Vapor									
Particle Emissions Factor (site-specific calculated value)	m^3/kg	7.3E10[8]	7.3E10[8]	7.3E10[8]	3.32E6[9]	7.3E10[8]	7.3E10[8]	7.3E10[8]	7.3E10[8]
Volatilization Factor	m^3/kg	Chemical specific							
Dermal Contact									
Skin Surface Area	cm^2								
Child (Youth[1])		2,690[1]	NA	NA	NA	NA	2800[3]	2800[3]	2800[3]
Adult		6,032[1]	3,470[1]	3,300[3]	3,300[4]	5,700[3]	NA	5700[3]	5700[3]

TABLE A-1-1: Assigned Values for Exposure Parameters used in Chemical Risk Assessment (Cont'd)

Parameter	Units	Resident	Industrial Worker	Maintenance /Surveillance Worker	Construction Worker	Trespasser Adult	Trespasser Youth	CTUIR Resident	Yakama Resident
Soil Adherence Factor	mg/cm^2-day								
Child (Youth[1])		0.2[1]	NA	NA	NA	NA	0.2[3]	0.2[3]	0.2[3]
Adult		0.07[1]	0.12[1]	0.1[3]	0.3[4]	0.07[3]	NA	0.07[3]	0.07[3]

Footnote

1 EPA, 2014, "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factor, "OSWER Directive 9200.1-120, Office of Solid Waste and Emergency Response, February.

2 EPA/540/1-89/002, 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A): Interim Final, U.S. Environmental Protection Agency, Washington, D.C. Available at: http://epa.gov/swerrims/riskassessment/ragsa/pdf/rags-vol1-pta_complete.pdf

3 EPA/540/R/99/005, 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*, OSWER Directive 9285.7-02EP, U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, Washington, D.C.

4 EPA 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Site. Office of Emergency and Remedial Response. OSWER Directive 9355.4-24, December.

5 EPA/600/P-95/002Fa, 1997, Exposure Factors Handbook: 2007 Edition, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.

6 Harris, S.G. and Harper, B.L. (2004). Exposure Scenario for CTUIR Traditional Subsistence Lifeways. Department of Science & Engineering, Confederated Tribes of the Umatilla Indian Reservation, P.O. Box 638, Pendleton, OR 97801.

7 Redolfi Inc. 2007. Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington. Prepared for Yakama Nation, ERWM Program, September, 2007.

8 ECF-HANFORD-11-0033, REV. 1, 2013, *Calculation of Inhalation Pathway Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Report*, CH2M HILL Plateau Remediation Company, Richland, Washington.

9 ECF-HANFORD-10-0449, 2013, *Calculation of Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Report*, CH2M HILL Plateau Remediation Company, Richland, Washington.

TABLE A-1-2: Default Values for Exposure Parameters used in MTCA Method B Standard

Parameter	Units	Assigned Value	References
Soil Ingestion Pathway			
Soil ingestion rate	mg/day	200	MTCA Method B, Equations 740-1 and 740-2
Gastrointestinal Absorption Fraction	unitless	1	
Exposure frequency	unitless	1	
Exposure duration, child	years	6	
Average body weight	kg	16	
Carcinogenic averaging time	years	75	MTCA Method B, Equation 740-2
Noncarcinogenic averaging time	years	6	MTCA Method B, Equation 740-1
Inhalation Pathway			
Particulate Emissions Factor	m^3/kg	7.3E10	ECF-HANFORD-11-0033
Exposure frequency	unitless	1	MTCA Method B, Equations 750-1 and 750-2
Inhalation Absorption Fraction	unitless	1	
Carcinogens			
Breathing rate, adult	m^3/day	20	MTCA Method B, Equation 750-2
Exposure duration, adult	years	30	
Average Body Weight, adult	kg	70	
Carcinogenic averaging time	years	75	
Noncarcinogens			
Breathing rate, child	m^3/day	10	MTCA Method B, Equation 750-1
Exposure duration, child	years	6	
Average Body Weight, child	kg	16	
Noncarcinogenic averaging time	years	6	

ECF-HANFORD-11-0033, *Calculation of Inhalation Pathway Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Reports*.

WAC 173-340, "Model Toxics Control Act—Cleanup," *Washington Administrative Code*, Olympia, Washington.

340-740, "Unrestricted Land Use Soil Cleanup Standards"

340-750, "Cleanup Standards to Protect Air Quality."

TABLE A-1-3: Default Values for Exposure Parameters used in MTCA Method C Standards

Parameter	Units	MTCA Method C	Source
Soil Ingestion Pathway			
Soil ingestion rate	mg/day	50	MTCA Method C, Equations 745-1 and 745-2
Gastrointestinal Absorption Fraction	unitless	1	
Exposure frequency	unitless	0.4	
Exposure duration	years	20	
Average Body Weight	kg	70	
Unit correction factor	kg/mg	10^{-6}	
Carcinogenic averaging time	years	75	MTCA Method C, Equation 745-2
Noncarcinogenic averaging time	days	20	MTCA Method C, Equation 745-1
Inhalation Pathway			
Particulate Emissions Factor	m^3/kg	7.3E10	ECF-HANFORD-11-0033
Breathing rate	m^3/day	20	MTCA Method C, Equations 750-1 and 750-2
Inhalation Absorption Fraction	unitless	1	
Exposure frequency	unitless	1	
Exposure duration, adult	years	30	MTCA Method C, Equation 750-2
Carcinogenic averaging time	years	75	
Exposure duration, child	years	6	MTCA Method C, Equation 750-1
Noncarcinogenic averaging time	days	6	

ECF-HANFORD-11-0033, *Calculation of Inhalation Pathway Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Reports*.

WAC 173-340, "Model Toxics Control Act—Cleanup," *Washington Administrative Code*, Olympia, Washington.

340-745, "Soil Cleanup Standards for Industrial Properties."

340-750, "Cleanup Standards to Protect Air Quality."

ATTACHMENT A-2

ASSIGNED VALUES FOR EXPOSURE PARAMETERS USED IN RESRAD MODEL

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
PATHWAY SELECTIONS						
External Gamma	NA	Active	Active	NA	Active for all receptor scenarios	NA
Inhalation (without radon)	NA	Active	Active	NA	Active for all receptor scenarios	NA
Plant Ingestion	NA	Active	Active	NA	Active for Resident, CTUIR and Yakama Resident	NA
Meat Ingestion	NA	Active	Active	NA	Active for Resident, CTUIR and Yakama Resident	NA
Milk Ingestion	NA	Active	Active	NA	Active for Resident, CTUIR and Yakama Resident	NA
Aquatic Foods	NA	Active	**Inactive**	NA	No Surface water body	NA
Drinking Water	NA	Active	**Inactive**	NA	Evaluated as a part of GW OU	NA
Soil Ingestion	NA	Active	Active	NA	Active for all receptor scenarios	NA
Radon	NA	Inactive	Inactive	NA	NA per Federal Register, 1994, p. 43210	NRC 1994
CONTAMINATED ZONE PARAMETERS						
Area of contaminated zone	AREA	10,000	2000	m^2	Site-Specific Value.	
Thickness of contaminated zone	THICK0	2	**4.6**	m	Site-specific Value	ECF-HANFORD-10-0429, REV 1
Length parallel to the aquifer	LCZPAQ	100	45/ NA	m	For residential scenario cases, the length parallel to the aquifer was calculated as the square root of the contaminated zone area. NA for other scenarios	ANL 2009
Times for calculations	TI	1, 3, 10, 30, 100, 300, 1000	1, 3, 10, 30, 100, 300, 1000	yr	RESRAD defaults for calculation times.	ANL 2009
COVER AND CONTAMINATED ZONE HYDROLOGICAL DATA						
Cover depth	COVER	0	**0**	M	As a conservative approach, no cover is assumed.	
Density of cover material	DENSCV	1.5	**NA**	g/cm^3	Not applicable due to no soil cover	NA
Cover erosion rate	VCV	0.001	**NA**	m/yr	Not applicable due to no soil cover	NA
Density of contaminated zone	DENSCZ	1.5	**1.6**	g/cm^3	Hanford 100 Area specific data	DOE/RL-90-07
Contaminated zone erosion rate	VCZ	0.001	**0.001**	m/yr	RESRAD Default	ANL 2009
Contaminated zone total porosity	TPCZ	0.4	0.4	unitless	WDOH guidance	WDOH/320-015
Contaminated zone field capacity	FCCZ	0.2	0.15	unitless	WDOH guidance	WDOH/320-015
Contaminated zone hydraulic conductivity	HCCZ	10	250	m/yr	Hanford 100 Area-specific data	DOE/RL-96-11

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Contaminated zone b parameter	BCZ	5.3	**4.05**	unitless	WDOH guidance	WDOH/320-015
Humidity in air	HUMID	8	**8**	g/m^3	RESRAD Default	ANL 2009
Evapotranspiration coefficient	EVAPTR	0.5	0.91	unitless		Letter than EPA
Wind speed	WIND	2	3.4	m/sec	Hanford Site average	PNNL-12087
Precipitation	PRECIP	1	0.16	m/yr	Based on 16 cm (6.3 in.) average annual rainfall	DOE/RL-90-07
Irrigation	RI	0.2	0.76	m/yr	EPA, Region X guidance	Letter than EPA
Irrigation mode	IDITCH	Overhead	Overhead	unitless	RESRAD Default	ANL 2009
Runoff coefficient	RUNOFF	0.2	0.2	unitless	RESRAD Default	ANL 2009
Watershed area for nearby stream or pond	WAREA	1.00E6	1.00E6	m^2	RESRAD default used.	ANL 2009
Accuracy for water/soil computations	EPS	0.001	0.001	Unitless	RESRAD Default	ANL 2009
SATURATED ZONE HYDROLOGICAL DATA (Not Active for Industrial, Maintenance/Surveillance, Construction and Trespasser Scenario)						
Density of saturated zone	DENSAQ	1.5	1.6	g/cm^3	Hanford 100 Area-specific data	DOE/RL-90-07
Saturated zone total porosity	TPSZ	0.4	0.4	unitless	WDOH guidance	WDOH/320-015
Saturated zone effective porosity	EPSZ	0.2	0.25	unitless	Agreement among the Tri-Parties	ANL/EAD/LD-2, Table 3.2
Saturated zone field capacity	FCSZ	0.2	0.15	unitless	Field capacity = total porosity - effective porosity	ANL/EAD/LD-2, Equation 4.4
Saturated zone hydraulic conductivity	HCSZ	100	5530	m/yr	Hanford 100-Area specific data	DOE/RL-96-11 DOE/RL-93-37
Saturated zone hydraulic gradient	HGWT	0.02	1.25E-3	unitless	Based on GW velocity = 27.8 m/yr, porosity = 0.25, hydraulic conductivity = 5,530	DOE/RL-94-136
Saturated zone b parameter	BSZ	5.3	4.05	unitless	WDOH guidance	WDOH/320-015
Water table drop rate	VWT	0.001	0.001	m/yr	RESRAD Default	ANL 2009

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Well pump intake depth (meters below water table)	DWIBWT	10	**4.6**	m	Typical RCRA well screen length	ECF-HANFORD-10-0429, REV 1
Model for Water Transport Parameters [Non-dispersion (ND) or Mass-Balance (MB)]	MODEL	ND	ND	unitless	RESRAD Default	ANL 2009
Well pumping rate	UW	250	250	m^3/yr	RESRAD Default	ANL 2009
UNCONTAMINATED UNSATURATED ZONE PARAMETERS (Not Active for Industrial, Maintenance/Surveillance, Construction and Trespasser Scenario)						
Number of unsaturated zone strata	NS	1	1	unitless	Based on site-specific soil type	ANL 2009
Unsaturated zone thickness	H(1)	4	12	m	Site-specific	ECF-HANFORD-10-0429, REV 1
Unsaturated zone soil density	DENSUZ(1)	1.5	1.6	g/cm^3	Hanford 100 Area-specific data	DOE/RL-90-07
Unsaturated zone total porosity	TPUZ(1)	0.4	0.4	unitless	WDOH guidance	WDOH/320-015
Unsaturated zone effective porosity	EPSZ(1)	0.2	0.25	unitless	Agreement among the Tri-Parties	ANL/EAD/LD-2, Table 3.2
Unsaturated zone field capacity	FCSZ(1)	0.2	0.15	unitless	Field capacity = total porosity - effective porosity	ANL/EAD/LD-2, Equation 4.4
Unsaturated zone hydraulic conductivity	HCSZ(1)	10	250	m/yr	Hanford 100 Area-specific data	DOE/RL-96-11
Unsaturated zone b parameter	BSZ	5.3	4.05	unitless	WDOH guidance	WDOH/320-015
ELEMENTAL DISTRIBUTION (PARTITION) COEFFICIENTS AND LEACH RATES: Radionuclides						
Contaminated zone	DCNUCC(1)		See following table A-2-2	cm^3/g	Based on site-specific soil type	ECF-HANFORD-10-0429, REV 1
Unsaturated zone	DCNUCU(1, 1)			cm^3/g		
Saturated zone	DCNUCS(1)			cm^3/g		

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
OCCUPANCY, INHALATION AND EXTERNAL GAMMA DATA						
Inhalation rate	INHALR	8,400	**7300** **7300** **10950** **9490**	m^3/y	WDOH Guidance Industrial, Maintenance/ Surveillance and Construction Worker, Trespasser CTUIR Resident Yakama Resident	ECF-HANFORD-10-0429, REV 1 OSWER Directive 9285.6-03 Harris and Harper, 2004 Ridolfi, Inc., 2007
Mass loading for inhalation	MLINH	0.0001	**1.4E-8** **3.00E-04**	g/m^3	Non-construction (1/PEF); PEF = 7.3E+7 Construction (1/PEF); PEF = 3.32E6	
Exposure duration	ED	30	**26** **25** **1** **14** **7** **70** **70**	yr	Residential Industrial Worker and Maintenance/ Surveillance Worker Construction Worker Trespasser (Adult) Trespasser (Youth) CTUIR Resident Yakama Resident	EPA 2014 EPA 1991a,b, EPA 2014 Assumption Assumption Harris and Harper, 2004 Ridolfi, Inc., 2007
Inhalation shielding factor	SHF3	0.4	0.4	unitless	RESRAD default used.	ANL 2009
External gamma shielding factor	SHF1	0.7	**0.4**	unitless	60% shielding per EPA, cited reference used for all indoor receptors.	EPA, 2000
Indoor time fraction	FIND	0.5	**0.658** **0.17** **0** **0.5** **0.71**	unitless	Residential (15 hrs/d for 350 d/yr) Industrial Worker (6 hrs/d for 250 d/yr) Maintenance, Construction and Trespasser (outdoor scenarios) CTUIR Resident (12 hr/day) Yakama Resident (17 hr/day)	ECF-HANFORD-10-0429, REV 1 Assumption Assumption Harris and Harper, 2004 Ridolfi, Inc., 2007
Outdoor time fraction	FOTD	0.25	**0.12** **0.057** **0.124** **0.0274** **0.015** **0.066** **0.5** **0.29**	unitless	Residential (3 hrs/d for 350 d/yr) Industrial Worker (1 hrs/d for 250 d/yr) Maintenance/ Surveillance Worker (8 hrs/d for 136 d/yr) , Construction Worker (8 hrs/d for 30 d/yr) Trespasser (Adult) (8 hrs/d for 16 d/yr) Trespasser (Youth) (8 hrs/d for 72 d/yr) CTUIR Resident (12 hrs/day) Yakama Resident (9 hrs/day)	ECF-HANFORD-10-0429, REV 1 Assumption Assumption Assumption Assumption Assumption Harris and Harper, 2004 Ridolfi, Inc., 2007
Shape of the contaminated zone (circular or non-circular)	FS	Circular	Circular	unitless	RESRAD default used.	ANL 2009

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
INGESTION PATHWAY (DIETARY DATA)						
Fruits, vegetables and grain consumption	DIET(1)	160	**145.5** **224** **103.7**	kg/yr	Resident (See calculation below) CTUIR Resident Yakama Resident (see calculation below)	EPA 2011, EPA 2014 Harris and Harper, 2004 Ridolfi, Inc., 2007
Leafy vegetable consumption	DIET(2)	14	**9** **63** **378**	kg/yr	Resident (See calculation below) CTUIR Resident Yakama Resident (see calculation below)	EPA 2011, EPA 2014 Harris and Harper, 2004 Ridolfi, Inc., 2007
Milk consumption	DIET(3)	92	**117.2** **187** **416.5**	L/yr	Resident (See calculation below) CTUIR Resident Yakama Resident	EPA 2011, EPA 2014 Harris and Harper, 2004 Ridolfi, Inc., 2007
Meat and poultry consumption	DIET(4)	63	**45** **147.5** **241.7**	kg/yr	Resident (See calculation below) CTUIR Resident Yakama Resident (see calculation below)	EPA 2011, EPA 2014 Harris and Harper, 2004 Ridolfi, Inc., 2007
Fish consumption	DIET(5)	5.4	**NA**	kg/yr	Pathway not active	NA
Other seafood consumption	DIET(6)	0.9	**NA**	kg/yr	Pathway not active	NA
Soil ingestion rate	SOIL	36.5	**44.9** **18.25** **36.5** **120.45** **36.5** **146** **79.3**	g/yr	Residential (See calculation below) Industrial Worker Maintenance/ Surveillance Worker Construction Worker Trespasser (Youth and Adult) CTUIR Resident Yakama Resident (see calculation below)	EPA 2011 EPA 1991, EPA 2014 EPA 1991, EPA 2014 EPA 2002 EPA 1989 Harris and Harper, 2004 Ridolfi, Inc., 2007
Drinking water intake	DW1	510	**NA**	L/yr	Not Active Pathway	NA
Contamination fraction of drinking water	FDW	1	**NA**	kg/yr	Not Active Pathway	NA
Contamination fraction of household water	FHHW	1	**NA**	kg/yr	Not Active pathway	NA
Contamination fraction of livestock water	FLW	1	1	unitless	Pathway active	ANL 2009
Contamination fraction of irrigation water	FIRW	1	1	unitless	Pathway active	ANL 2009
Contamination fraction of aquatic food	FR9	0.5	**NA**	unitless	Pathway not active	NA
Contaminated fraction of plant food	FPLANT	-1	0.15	unitless	RESRAD default used.	ANL 2009
Contaminated fraction of meat	FMEAT	-1	-1	unitless	RESRAD default used.	ANL 2009
Contaminated fraction of milk	FMILK	-1	-1	Unitless	RESRAD default used.	ANL 2009

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
INGESTION PATHWAY (NON-DIETARY DATA) (Not Active for Industrial, Maintenance/Surveillance, Construction and Trespasser Scenario)						
Livestock fodder intake for meat	LP15	68	68	kg/day	RESRAD default used.	ANL 2009
Livestock fodder intake for milk	LP16	55	55	kg/day	RESRAD default used.	ANL 2009
Livestock water intake for meat	LW15	50	50	L/day	RESRAD default used.	ANL 2009
Livestock water intake for milk	LW15	160	160	L/day	RESRAD default used.	ANL 2009
Livestock intake of soil	LS1	0.5	0.5	kg/day	RESRAD default used.	ANL 2009
Mass loading for foliar deposition	MLFD	0.0001	0.0001	g/m^3	RESRAD default used.	ANL 2009
Depth of soil mixing layer	DM	0.15	0.15	m	RESRAD default used.	ANL 2009
Depth of roots	DROOT	0.9	0.9	m	RESRAD default used.	ANL 2009
Groundwater fractional usage: Drinking water	FGWDW	1	**NA**	unitless	Pathway not active	NA
Groundwater fractional usage: Household water	FGWHH	1	**NA**	unitless	Pathway not active	NA
Groundwater fractional usage: Livestock water	FGWLW	1	1	unitless	RESRAD default used.	ANL 2009
Groundwater fractional usage: Irrigation water	FGWIR	1	1	unitless	RESRAD default used.	ANL 2009
PLANT TRANSPORT FACTORS (Not Active for Industrial, Maintenance/Surveillance, Construction and Trespasser Scenario)						
Wet weight crop yield: non-leafy vegetables	YV(1)	0.7	0.7	kg/m^2	RESRAD default used.	ANL 2009
Wet weight crop yield: leafy vegetables	YV(2)	1.5	1.5	kg/m^2	RESRAD default used.	ANL 2009
Wet weight crop yield: fodder	YV(3)	1.1	1.1	kg/m^2	RESRAD default used.	ANL 2009
Length of growing season: non-leafy vegetables	TE(1)	0.17	0.17	years	RESRAD default used.	ANL 2009
Length of growing season: leafy vegetables	TE(2)	0.25	0.25	years	RESRAD default used.	ANL 2009
Length of growing season: fodder	TE(3)	0.08	0.08	years	RESRAD default used.	ANL 2009
Translocation factor: non-leafy vegetables	TIV(1)	0.1	0.1	unitless	RESRAD default used.	ANL 2009
Translocation factor: leafy vegetables	TIV(2)	1	1	unitless	RESRAD default used.	ANL 2009
Translocation factor: fodder	TIV(3)	1	1	unitless	RESRAD default used.	ANL 2009
Weathering removal constant	WLAM	20	20	y^{-1}	RESRAD default used.	ANL 2009
Wet foliar interception fraction: non-leafy vegetables	RWET(1)	0.25	0.25	unitless	RESRAD default used.	ANL 2009

Table A-2-1: Default and Recommended Values for RESRAD Input Parameters

RESRAD Version 6.5					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Wet foliar interception fraction: leafy vegetables	RWET(2)	0.25	0.25	unitless	RESRAD default used.	ANL 2009
Wet foliar interception fraction: fodder	RWET(3)	0.25	0.25	unitless	RESRAD default used.	ANL 2009
Dry foliar interception fraction: non-leafy vegetables	RDRY(1)	0.25	0.25	unitless	RESRAD default used.	ANL 2009
Dry foliar interception fraction: leafy vegetables	RDRY(2)	0.25	0.25	unitless	RESRAD default used.	ANL 2009
Dry foliar interception fraction: fodder	RDRY(3)	0.25	0.25	unitless	RESRAD default used.	ANL 2009
STORAGE TIMES BEFORE USE (Not Active for Industrial, Maintenance/Surveillance, Construction and Trespasser Scenario)						
Fruits, non-leafy vegetables and grain	STOR_T(1)	14	14	days	RESRAD default used.	ANL 2009
Leafy vegetables	STOR_T(2)	1	1	days	RESRAD default used.	ANL 2009
Milk	STOR_T(3)	1	1	days	RESRAD default used.	ANL 2009
Meat	STOR_T(4)	20	20	days	RESRAD default used.	ANL 2009
Fish	STOR_T(5)	7	NA	days	Pathway not active	NA
Crustacea and mollusks	STOR_T(6)	7	NA	days	Pathway not active.	NA
Well water	STOR_T(7)	1	1	days	RESRAD default used.	ANL 2009
Surface water	STOR_T(8)	1	1	days	RESRAD default used.	ANL 2009
Livestock fodder	STOR_T(9)	45	45	days	RESRAD default used.	ANL 2009

NOTE:
NA = Not applicable.

Table A-2-2: Radionuclide-specific Distribution Coefficients (Kd)

Radionuclides COPCs	Contaminated Zone Layer (cm^3/g)	Unsaturated Zone and Saturated Zone (cm^3/g)
Am-241	200	200
C-14	200	200
Co-60	50	50
Cs-137	50	50
H-3	0	0
I-129	1	1
Ni-63	30	30
Np-237	15	15
Pu-238	200	200
Pu-239	200	200
Pu-241	200	200
Se-79	0	0
Sn-126	0	0
Sr-90	25	25
Tc-99	0	0
U-233	50	50
U-234	50	50
U-235	50	50
U-238	50	50

Calculation of Assigned Values for Intake Parameters - Residential Receptor Scenario

(1) Determination of Total Fruits, Vegetables and Grain Consumption Rate

Body Weight for Child (0-1)

Age Group	Month	Mean Weight (Kg)	References
0-1	1	4.8	**Mean value from Table ES-1 of EFH (USEPA, 2011)**
1-3	2	5.9	
3-6	3	7.4	
6-12	6	9.2	
Weighted Body Weight for Child (0-1)		**7.83**	

Consumption Rate for Child (0-6)

Age Group	Years	Fruit Intake (g/kg-day)	Vegetable Intake (g/kg-day)	Grain Intake (g/kg-day)	Total Intake Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
0-1	1	6.2	5	3.1	14.3	7.83	112.0	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
1-2	1	7.8	6.7	6.4	20.9	11.4	238.3	
2-3	1	7.8	6.7	6.4	20.9	13.8	288.4	
3-6	3	4.6	5.4	6.2	16.2	18.6	301.3	
					Weighted Intake Rate		**257.10**	

Consumption Rate for Adult

Age Group	Years	Fruit Intake (g/kg-day)	Vegetable Intake (g/kg-day)	Grain Intake (g/kg-day)	Total Intake Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
18-21	3	0.9	2.3	2.4	5.6	71.6	401.0	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
21-38	17	0.9	2.5	2.2	5.6	80	448.0	
					Weighted Intake Rate		**440.94**	

Age-Weighted Total Fruits, Vegetables and Grains Consumption Rate

Receptor	Intake Rate (g/day)	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate (kg/yr)
Child	257.10	93.84	6	**145.5**
Adult	440.94	160.94	20	

Footnote

[1] Age-weighted total consumption rate = (93.84*6 + 160.94*20)/(20+6)

(2) Determination of Total Leafy Vegetables Consumption Rate

Based on USDA report, *Food Consumption, Prices and Expenditures 1970-1997* (Putnam et al., 1999), fresh vegetables accounted for 44% of the total vegetables consumed during the 25-year period. The fraction of non-leafy fresh vegetables consumed from 1972 – 1997 was estimated at 0.67 of the total fresh vegetable consumption rate.

The above statistics were considered during the estimation of leafy vegetable consumption rate for residential receptor.

Body Weight for Child (0-1)

Age Group	Month	Mean Weight (Kg)	References
0-1	1	4.8	**Mean value from Table ES-1 of EFH (USEPA, 2011)**
1-3	2	5.9	
3-6	3	7.4	
6-12	6	9.2	
Weighted Body Weight for Child (0-1)		**7.83**	

Consumption Rate for Child (0-6)

Age Group	Years	Vegetable Intake (g/kg-day)	Leafy Vegetable Intake Rate (g/kg-day)[1]	Body Weight (kg)	Intake Rate (g/day)	References
0-1	1	5	0.726	7.83	5.7	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
1-2	1	6.7	0.97	11.4	11.1	
2-3	1	6.7	0.97	13.8	13.4	
3-6	3	5.4	0.78	18.6	14.6	
			Weighted Intake Rate		**12.33**	

[1] Leafy Vegetable Intake Rate = (Vegetable Intake x 44% x 33%)

Consumption Rate for Adult

Age Group	Years	Vegetable Intake (g/kg-day)	Leafy Vegetable Intake Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
18-21	3	2.3	0.33	71.6	23.9	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
21-38	17	2.5	0.36	80	29.0	
			Weighted Intake Rate		**28.23**	

Age-Weighted Leafy Vegetable Consumption Rate

Receptor	Intake Rate (g/day)	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate (kg/yr)
Child	12.33	4.50	6	**9.0**
Adult	28.23	10.3	20	

Footnote

[1] Age-weighted total leafy vegetable consumption rate = (4.5*6 + 10.3*20)/(20+6)

(3) Determination of Milk Consumption Rate

Body Weight for Child (0-1)

Age Group	Month	Mean Weight (Kg)	References
0-1	1	4.8	**Mean value from Table ES-1 of EFH (USEPA, 2011)**
1-3	2	5.9	
3-6	3	7.4	
6-12	6	9.2	
Weighted Body Weight for Child (0-1)		**7.83**	

Consumption Rate for Child (0-6)

Age Group	Years	Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
0-1	1	10.1	7.83	79.1	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
1-2	1	43.2	11.4	492.5	
2-3	1	43.2	13.8	596.2	
3-6	3	24	18.6	446.4	
		Weighted Intake Rate		**417.82**	

Consumption Rate for Adult

Age Group	Years	Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
18-21	3	5.5	71.6	393.8	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
21-38	17	3.5	80	280.0	
		Weighted Intake Rate		**297.07**	

Age-Weighted Total Milk Consumption Rate

Receptor	Intake Rate (g/day)	Intake Rate (L/yr)	Exposure Duration (yr)	Weighted Consumption Rate (L/yr)
Child	417.82	152.50	6	**117.2**
Adult	297.07	108.43	20	

Footnote

[1] Age-weighted total milk consumption rate = (152.5*6 + 108.4*20)/(20+6)

(4) Determination of Meat and Poultry Consumption Rate

Body Weight for Child (0-1)

Age Group	Month	Mean Weight (Kg)	References
0-1	1	4.8	**Mean value from Table ES-1 of EFH (USEPA, 2011)**
1-3	2	5.9	
3-6	3	7.4	
6-12	6	9.2	
Weighted Body Weight for Child (0-1)		**7.83**	

Consumption Rate for Child (0-6)

Age Group	Years	Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
0-1	1	1.2	7.83	9.4	**Mean Value from Table ES-1 of EFH (USEPA, 2011)**
1-2	1	4	11.4	45.6	
2-3	1	4	13.8	55.2	
3-6	3	3.9	18.6	72.5	
		Weighted Intake Rate		**54.64**	

Consumption Rate for Adult

Age Group	Years	Rate (g/kg-day)	Body Weight (kg)	Intake Rate (g/day)	References
18-21	3	2	71.6	143.2	**Mean Value from Table ES-1 of EFH (2011)**
21-38	17	1.8	80	144.0	
		Weighted Intake Rate		**143.9**	

Age-Weighted Total Meat Consumption Rate

Receptor	Intake Rate (g/day)	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate (Kg/yr)
Child	54.64	19.94	6	**45.0**
Adult	143.9	52.52	20	

Footnote

[1] Age-weighted total meat consumption rate = (19.94*6 + 52.52*24)/(20+6)

(5) Determination of Soil Ingestion Rate

Receptor	Intake Rate (mg/day)	Intake Rate (g/yr)	Exposure Duration (yr)	Weighted Consumption Rate (g/yr)
Child	200	73.0	6	**44.92**
Adult	100	36.5	20	

Footnote

[1] Age-weighted total ingestion rate = (73*6 + 36.5*20)/(20+6)

Calculation of Assigned Values for Intake Parameters – Yakama Nation Resident Scenario

Determination of Total Fruits, Vegetables and Grain Consumption Rate

Fruits, Vegetables and Grain Consumption Rate

Receptor	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate (kg/yr)
Adult	109.00	64	**103.7**
Child	47.00	6	

Leafy Vegetable Consumption Rate

Receptor	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate (kg/yr)
Adult	407.00	64	**378.0**
Child	68.30	6	

Milk Consumption Rate

Receptor	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate[1] (kg/yr)
Adult	438.00	64	**416.5**
Child	187.00	6	

[1] Age-weighted total consumption rate = (187*6 + 438*64)/(64+6)

Meat and Poultry Consumption Rate

Receptor	Intake Rate (kg/yr)	Exposure Duration (yr)	Weighted Consumption Rate[1] (kg/yr)
Adult	257.00	64	**241.7**
Child	78.00	6	

[1] Age-weighted total consumption rate = (78*6 + 257*64)/(64+6)

Determination of Soil Ingestion Rate

Receptor	Intake Rate (mg/day)	Intake Rate (g/yr)	Exposure Duration (yr)	Weighted Consumption Rate[1] (g/yr.)
Child	400	146	6	**79.3**
Adult	200	73	64	

Footnote

1 Age-weighted total ingestion rate = (146*6 + 73*64)/(64+6)

REFERENCES

Argonne National Laboratory (ANL). 1993. *Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil*, ANL/EAIS-8, Argonne National Laboratory, Environmental Assessment Division, Argonne, Illinois. April.

ANL/EAD/LD-2, 1993, Manual for Implementing Residual Radioactive Materials Guidelines Using RESRAD, Version 5.0, Evnironmental Assessment Division, Argonne National Laboratory, Argonne, I

ANL/EAD-4, 2001, User's Manual for RESRAD Version 6, , Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois

ANL, 2009, RESRAD for Windows, Version 6.5, Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois

DOE/RL-96-17, 2009, Remedial Design Report/Remedial Action Work Plan for the 100 Area, Rev. 6 (For Approval July 2009), U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Nuclear Regulatory Commission (NRC). 1994. Federal Register Notice, Volume 59, Number 161, *Comments from Workshops: Radon*, U.S. Nuclear Regulatory Commission, Washington, D.C.

Nuclear Regulatory Commission (NRC). 2000. Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes, NUREG/CR-6697, ANL/EAD/TM-98.

PNNL-12087, 1999, Hanford Site Climatological Data Summary 1998 with Historical Data, Pacific Northwest National Laboratory, Richland, Washington

PNNL-15160, 2005, Hanford Site Climatological Summary 2004 With Historical Data, Pacific Northwest National Laboratory, Richland, Washington

PNNL-14702, 2006, Vadose Zone Hydrology Data Package for Hanford Assessments, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington

PNNL-14753, 2006, Groundwater Data Package for Hanford Assessments, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington

PNNL-18564, 2009, Selection and Traceability of Parameters to Support Hanford-Specific RESRAD Analyses – Fiscal Year 2008 Status Repor, Pacific Northwest National Laboratory, Richland, Washington

WDOH/320-015, 1997, Hanford Guidance for Radiological Cleanup, Rev. 1, Washington State Department of Health, Olympia, Washington.

Environmental Protection Agency (EPA). 1989a. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), EPA 540/1-89/002, December 1989, PB90-155581.

Environmental Protection Agency (EPA). 1991a. Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals, OSWER Directive 9285.7-01B, Office of Emergency and Remedial Response, Washington, D.C.

Environmental Protection Agency (EPA). 1991b. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors, Interim Final, OSWER Directive 9285.6-03, EPA, Office of Emergency and Remedial Response, Washington, D.C.

Environmental Protection Agency (EPA). 1996. *Soil Screening Guidance: Users Guide*. Office of Solid Waste and Emergency Response, EPA/540/R-96/018, Office of Research and Development and Office of Emergency and Remedial Response, Washington, D.C.

Environmental Protection Agency (EPA). 1997. *Exposure Factors Handbook, Volumes 1, 2, and 3*, EPA/600/P-95/002Fa, b, and c, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. August.

Environmental Protection Agency (EPA). 2000. *Soil Screening Guidance for Radionuclides: User's Guide*. EPA/540-R-00-007. Washington, D.C.

Environmental Protection Agency (EPA). 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Site. Office of Emergency and Remedial Response. OSWER Directive 9355.4-24, December.

Environmental Protection Agency (EPA). 2004. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, Final. OSWER 9285.7-02EP, July.

Environmental Protection Agency (EPA). 2011. *Exposure Factors Handbook: 2011 Edison*, EPA/600/R-090/052F, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. September.

Environmental Protection Agency (EPA). 2014, "Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factor, "OSWER Directive 9200.1-120, Office of Solid Waste and Emergency Response, February.

ECF-HANFORD-11-0033, REV. 1, 2013, *Calculation of Inhalation Pathway Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Report*, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-HANFORD-10-0449, 2013, *Calculation of Preliminary Remediation Goals Using Standard Method B Air Cleanup Levels for the 100 Areas and 300 area Remedial Investigation/ Feasibility Study Report*, CH2M HILL Plateau Remediation Company, Richland, Washington.

Harris, S.G. and Harper, B.L. (2004). Exposure Scenario for CTUIR Traditional Subsistence Lifeways. Department of Science & Engineering, Confederated Tribes of the Umatilla Indian Reservation, P.O. Box 638, Pendleton, OR 97801.

Redolfi Inc. 2007. Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington. Prepared for Yakama Nation, ERWM Program, September, 2007.

WAC 173-340, "Model Toxics Control Act—Cleanup," *Washington Administrative Code*, Olympia, Washington.

340-740, "Unrestricted Land Use Soil Cleanup Standards"

340-745, "Soil Cleanup Standards for Industrial Properties."

340-750, "Cleanup Standards to Protect Air Quality."

APPENDIX B

TOXICOLOGICAL AND PHYSICAL PROPERTIES FOR NONRADIOLOGICAL AND RADIOLOGICAL COPCs

Table of Contents

Attachment B-1: Toxicological and Physical Properties for Nonradiological COPCs B-1

Table B-1: Toxicity and Physical Properties for Chemical COPCs B-2

Attachment B-2: Dose Conversion Factors and Risk Coefficients for Radiological COPCs.....B-4

Table B-2-1: Dose Conversion Factors for Radiological COPCs B-5

Table B-2-2: Risk Coefficients for Radiological COPCs B-6

ATTACHMENT B-1

TOXICOLOGICAL AND PHYSICAL PROPERTIES FOR NONRADIOLOGICAL COPCs

TABLE B-1: TOXICITY AND PHYSICAL PROPERTIES FOR CHEMICAL COPCs

Chemical COPCs	CAS#	Oral Toxicity Value (Including Reference)[1]				Inhalation Toxicity Values (Including Reference)[1]				GI Factor (%)	Calculated Dermal Toxicity Values[2]		Dermal Absorption Factor[1]	Volatilization Factor[3], m^3/kg
		Oral SF 1/(mg/kg-d)	Ref	RfDo (mg/kg-d)	Ref	Unit Risk $(ug/m^3)^{-1}$	Ref	RfCi (mg/m^3)	Ref		Dermal SF 1/(mg/kg-d)	RfDd (mg/kg-d)		
Aluminum	7429-90-5			1	P			0.005	P	100		1.0E+00		
Antimony	7440-36-0			0.0004	I					15		6.0E-05		
Arsenic	7440-38-2	1.5	I	0.0003	I	0.0043	I	0.000015	C	100	1.5E+00	3.0E-04	0.03	
Barium	7440-39-3			0.2	I			0.0005	H	7		1.4E-02		
Beryllium	7440-41-7			2.0E-03	I	2.4E-03	I	2.0E-05	I	0.7		1.4E-05		
Boron	7440-42-8			2.0E-01	I			2.0E-02	H	100		2.0E-01		
Cadmium	7440-43-9			0.001	I	0.0018	I	0.00001	A	2.5		2.5E-05	0.001	
Chromium	7440-47-3			3.00E-03	I	8.40E-02	I	1.00E-04		2.5		7.5E-05		
Cobalt	7440-48-4			0.0003	P	0.009	P	0.000006	P	100		3.0E-04		
Copper	7440-50-8			0.04	H					100		4.0E-02		
Fluoride	16984-48-8			0.04	C			0.013	C	100		4.0E-02		
Iron	7439-89-6			0.7	P					100		7.0E-01		
Lithium	7439-93-2			0.002	P					100		2.0E-03		
Manganese	7439-96-5			0.14	I			0.00005	I	100		1.4E-01		
Mercury	7439-97-6							3.0E-04	I	100				
Molybdenum	7439-98-7			5.0E-03	I					100		5.0E-03		
Nickel	7440-02-0			0.02	I	0.00026	C	0.00009	A	4		8.0E-04		
Nitrate	14797-55-8			7.1	I					100		7.1E+00		
Nitrite	14797-65-0			0.3	I					100		3.0E-01		
Selenium	7782-49-2			5.0E-03	I			2.0E-02	C	100		5.0E-03		
Silver	7440-22-4			0.005	I					4		2.0E-04		
Strontium	7440-24-6			0.6	I					100		6.0E-01		
Tin	7440-31-5			0.6	H					100		6.0E-01		
Total Uranium	#N/A			0.003	I			0.00004	A	100		3.0E-03		
Vanadium	7440-62-2			0.005	S			0.0001	A	2.6		1.3E-04		
Zinc	7440-66-6			0.3	I					100		3.0E-01		
Acetone	67-64-1			9.0E-01	I			3.1E+01	A			0.0E+00		13,696
Benzene	71-43-2	5.5E-02	I	4.0E-03	I	7.8E-06	I	3.0E-02	I	100	5.5E-02	4.0E-03		1,781
Bis(2-ethylhexyl) phthalate	117-81-7	1.4E-02	I	2.0E-02	I	2.4E-06	C			100	1.4E-02	2.0E-02	0.1	
1-Butanol	71-36-3			1.0E-01	I					100		1.0E-01	0.1	31,651
2-Butanone	78-93-3			6.0E-01	I			5.0E+00	I	100		6.0E-01		12,443

TABLE B-1: TOXICITY AND PHYSICAL PROPERTIES FOR CHEMICAL COPCs

Chemical COPCs	CAS#	Oral Toxicity Value (Including Reference)[1]				Inhalation Toxicity Values (Including Reference)[1]				GI Factor (%)	Calculated Dermal Toxicity Values[2]		Dermal Absorption Factor[1]	Volatilization Factor[3], m^3/kg
		Oral SF 1/(mg/kg-d)	Ref	RfDo (mg/kg-d)	Ref	Unit Risk $(ug/m^3)^{-1}$	Ref	RfCi (mg/m^3)	Ref		Dermal SF 1/(mg/kg-d)	RfDd (mg/kg-d)		
Butylbenzylphthalate	85-68-7	1.9E-03	P	2.0E-01	I					100	1.9E-03	2.0E-01	0.1	
Diethylphthalate	84-66-2			0.8	I					100		8.0E-01	0.1	
Di-n-butylphthalate	84-74-2			1.0E-01	I					100		1.0E-01	0.1	
2-Hexanone	591-78-6			5.0E-03	I			3.0E-02	I	100		5.0E-03		11,650
Hexane	110-54-3			6.0E-02	H			7.0E-01	I	100		6.0E-02		1,011
Methylene chloride	75-09-2	2.0E-03	I	6.0E-03	I	1.0E-08	I	6.0E-01	I	100	2.0E-03	6.0E-03		2,113
Toluene	108-88-3			8.0E-02	I			5.0E+00	I	100		8.0E-02		2,085
o-Xylene	95-47-6			2.0E-01	S			1.0E-01	S	100		2.0E-01		2,863
Styrene	100-42-5			2.0E-01	I			1.0E+00	I	100		2.0E-01		6,371
Xylenes (total)	1330-20-7			2.0E-01	I			1.0E-01	I	100		2.0E-01		2,269
Aldrin	309-00-2	1.7E+01	I	3.0E-05	I	4.9E-03	I			100	1.7E+01	3.0E-05	0.1	243,468
beta-BHC	319-85-7	1.8E+00	I			5.3E-04	I			100	1.8E+00		0.1	
Gamma-BHC (Lindane)	58-89-9	1.1E+00	C	3.0E-04	I	3.1E-04	C			100	1.1E+00	3.0E-04	0.04	
Aroclor-1254	11097-69-1	2	S	0.00002	I	0.00057	S			100	2.0E+00	2.0E-05	0.14	
Aroclor-1260	11096-82-5	2.0E+00	S			5.7E-04	S			100	2.0E+00		0.14	

[1] EPA Regional Screening Level (RSL) Tables, May 2014. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

References Cited in RSL Tables:

I = IRIS (Integrated Risk Information System Values)
P = PPRTV (Provisional Peer Reviewed Toxicity Values)
E = EPA Environmental Criteria and Assessment Office
C = Cal EPA (California EPA Chronic Reference Exposure Levels and Cancer Potency Values)
A = ATSDR (Agency for Toxic Substances and Disease Registry)
H = HEAST (Health Effects Assessment Summary Tables)
J = New Jersey Department of Environmental Protection
S = Surrogate of Xylenes (I)

[2] USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. July 2004. Exhibit 3-4. Also on the RAGs Part E homepage

[3] ECF-HANFORD-10-0444, Calculation of Inhalation Pathway Preliminary Remedial Goals under Method B Air Cleanup Levels for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports

APPENDIX B

ATTACHMENT B-2: DOSE CONVERSION FACTORS AND RISK COEFFICIENTS FOR RADIOLOGICAL COPCs

Table B-2-1: Dose Conversion Factors[1] for Radiological COPCs

Pathways	Ingestion	Inhalation	External Gamma
COPCs/Unit	mrem/pCi		(mrem/yr)/(pCi/g)
Am-241	3.64E-03	4.44E-01	4.37E-02
C-14	2.09E-06	2.09E-06	1.35E-05
Co-60	2.69E-05	2.19E-04	1.62E+01
Cs-137	5.00E-05	3.19E-05	7.51E-04
H-3	6.40E-08	6.40E-08	0.00E+00
I-129	2.76E-04	1.74E-04	1.30E-02
Ni-63	5.77E-07	6.29E-06	0.00E+00
Np-237	4.44E-03	5.40E-01	7.79E-02
Pu-238	3.20E-03	3.92E-01	1.51E-04
Pu-239	3.54E-03	4.29E-01	2.95E-04
Pu-241	6.84E-05	8.25E-03	5.90E-06
Se-79	8.69E-06	9.84E-06	1.86E-05
Sn-126	2.11E-05	1.01E-04	1.47E-01
Sr-90	1.53E-04	1.31E-03	7.04E-04
Tc-99	1.46E-06	8.32E-06	1.26E-04
U-233	2.89E-04	1.35E-01	1.40E-03
U-234	2.83E-04	1.32E-01	4.02E-04
U-235	2.67E-04	1.23E-01	7.21E-01
U-238	2.55E-04	1.18E-01	1.03E-04

[1] Derived Concentration Technical Standard, DOE-STD-1196-2011. DOE 2011

Table B-2-2 : Risk Coefficients[2] for Radiological COPCs

Pathways	External Gamma	Inhalation		Food Ingestion	Soil Ingestion
COPCs/Unit	1/yr per (pCi/g)	1/(pCi)			
Am-241	2.76E-08	3.77E-08		1.34E-10	1.34E-10
C-14 (Particulates and Gas)	7.83E-12	1.69E-11	1.99E-14	2.00E-12	2.00E-12
Co-60	1.24E-05	1.01E-10		2.23E-11	2.23E-11
Cs-137+D	2.55E-06	1.12E-10		3.74E-11	3.74E-11
H-3	0.00E+00	8.51E-13		1.44E-13	1.44E-13
I-129	6.10E-09	1.60E-10		3.22E-10	3.22E-10
Ni-63	0.00E+00	5.77E-12		9.51E-13	9.51E-13
Np-237+D	7.97E-07	2.87E-08		9.10E-11	9.10E-11
Pu-238	7.22E-11	5.22E-08		1.69E-10	1.69E-10
Pu-239	2.00E-10	5.51E-08		1.74E-10	1.74E-10
Pu-241	4.11E-12	8.66E-10		2.28E-12	2.28E-12
Se-79	1.10E-11	1.99E-11		9.69E-12	9.69E-12
Sn-126+D	8.83E-06	4.13E-10		3.92E-11	3.92E-11
Sr-90+D	1.96E-08	4.33E-10		9.53E-11	9.53E-11
Tc-99	8.14E-11	3.81E-11		4.00E-12	4.00E-12
U-233	9.82E-10	2.83E-08		9.69E-11	9.69E-11
U-234	2.52E-10	2.78E-08		9.55E-11	9.55E-11
U-235+D	5.43E-07	2.50E-08		9.76E-11	9.76E-11
U-238	4.99E-11	2.36E-08		8.66E-11	8.66E-11
U-238+D	1.14E-07	2.36E-08		1.21E-10	1.21E-10

[2] U.S. Environmental Protection Agency (USEPA). 2002. Federal Guidance Report No. 13: Cancer Risk Coefficients for Environmental Exposure to Radionuclides. EPA-402/R-99-001. Washington, D.C.

APPENDIX C

INTAKE AND RISK ASSESSMENT SUMMARY REPORT FOR NONRADIOLOGICAL COPCs

Table of Contents

Attachment C-1: Results of Nonradiological Risk Assessment under Industrial Worker Scenario C-1

Attachment C-2: Results of Nonradiological Risk Assessment under Industrial Worker Scenario Based on MTCA Method C Standard C-105

Attachment C-3: Results of Nonradiological Risk Assessment under Construction Worker Scenario C-173

Attachment C-4: Results of Nonradiological Risk Assessment under Maintenance/ Surveillance Worker Scenario C-275

Attachment C-5: Results of Nonradiological Risk Assessment under Adult Trespasser Receptor Scenario C-377

Attachment C-6: Results of Nonradiological Risk Assessment under Trespasser Youth Receptor Scenario C-479

Attachment C-7: Results of Nonradiological Risk Assessment under Residential Adult Receptor Scenario C-581

Attachment C-8: Results of Nonradiological Risk Assessment under Residential Child Receptor Scenario C-683

Attachment C-9: Results of Nonradiological Risk Assessment for Residential Receptor Scenario Based on MTCA Method B Standard C-785

Attachment C-10: Results of Nonradiological Risk Assessment under CTUIR Residential Adult Receptor Scenario C-857

Attachment C-11: Results of Nonradiological Risk Assessment under CTUIR Residential Child Receptor Scenario C-959

Attachment C-12: Results of Nonradiological Risk Assessment under Yakama Residential Adult Receptor Scenario C-1061

Attachment C-13: Results of Nonradiological Risk Assessment under Yakama Residential Child Receptor Scenario C-1163

Appendix C

Attachment C-1: Results of Nonradiological Risk Assessment under Industrial Worker Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.15E-03	=	[	7.55E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	4.06E-08	=	[	2.65E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	5.73E-07	=	[	3.75E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.30E-05	=	[	8.50E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.48E-08	=	[	9.67E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.46E-06	=	[	9.54E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.39E-06	=	[	9.09E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	1.95E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	3.40E-07	=	[	2.23E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.68E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.27E-06	=	[	8.33E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.41E-05	=	[	3.54E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.66E-06	=	[	1.08E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.39E-06	=	[	9.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	1.41E-07	=	[	9.25E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	7.38E-09	=	[	4.83E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.77E-06	=	[	3.77E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Tin	1.77E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	8.82E-08	=	[	5.77E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	9.17E-06	=	[	6.00E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	6.97E-06	=	[	4.56E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Diethylphthalate	5.20E-08	=	[	3.40E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1254	1.15E-09	=	[	7.54E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.23E-03	=	[	7.55E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.14E-07	=	[	2.65E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	1.61E-06	=	[	3.75E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.64E-05	=	[	8.50E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.14E-08	=	[	9.67E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	4.08E-06	=	[	9.54E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.89E-06	=	[	9.09E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.46E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	9.52E-07	=	[	2.23E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.03E-02	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.57E-06	=	[	8.33E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.52E-04	=	[	3.54E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	4.64E-06	=	[	1.08E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	3.88E-06	=	[	9.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	3.96E-07	=	[	9.25E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	2.07E-08	=	[	4.83E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.62E-05	=	[	3.77E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Tin	4.97E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.47E-07	=	[	5.77E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.57E-05	=	[	6.00E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.95E-05	=	[	4.56E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Diethylphthalate	1.46E-07	=	[	3.40E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1254	3.23E-09	=	[	7.54E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.43E-06	=	[	1.0E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.96E-10	=	[	3.6E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	4.19E-09	=	[	5.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	9.49E-08	=	[	1.2E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.08E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.07E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	1.02E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.42E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	2.49E-09	=	[	3.0E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.69E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	9.31E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	3.95E-07	=	[	4.8E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.21E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.01E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.03E-09	=	[	1.3E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	5.39E-11	=	[	6.6E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	4.22E-08	=	[	5.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	1.30E-08	=	[	1.6E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	6.45E-10	=	[	7.9E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	6.70E-08	=	[	8.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.09E-08	=	[	6.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Diethylphthalate	3.80E-10	=	[	4.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1254	8.42E-12	=	[	1.0E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	2.36E-05	=	[	1.0E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	8.30E-10	=	[	3.6E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.17E-08	=	[	5.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.66E-07	=	[	1.2E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	3.03E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.98E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.84E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	3.99E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	6.96E-09	=	[	3.0E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.53E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.61E-08	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.11E-06	=	[	4.8E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.39E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.83E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	2.89E-09	=	[	1.3E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.51E-10	=	[	6.6E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.18E-07	=	[	5.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	3.63E-08	=	[	1.6E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.81E-09	=	[	7.9E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.88E-07	=	[	8.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.43E-07	=	[	6.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Diethylphthalate	1.06E-09	=	[	4.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1254	2.36E-11	=	[	1.0E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.43E-07	=	[	3.75E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.23E-10	=	[	9.67E-02	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Diethylphthalate	4.33E-08	=	[	3.40E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1254	1.34E-09	=	[	7.54E-03	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	4.01E-07	=	[	3.75E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	3.45E-10	=	[	9.67E-02	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Diethylphthalate	1.21E-07	=	[	3.40E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1254	3.76E-09	=	[	7.54E-03	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.15E-03	x	0.00E+00	=	0.00E+00	3.23E-03	/	1.00E+00	=	3.23E-03
Antimony	4.06E-08	x	0.00E+00	=	0.00E+00	1.14E-07	/	4.00E-04	=	2.84E-04
Arsenic	5.73E-07	x	1.50E+00	=	8.60E-07	1.61E-06	/	3.00E-04	=	5.35E-03
Barium	1.30E-05	x	0.00E+00	=	0.00E+00	3.64E-05	/	2.00E-01	=	1.82E-04
Cadmium	1.48E-08	x	0.00E+00	=	0.00E+00	4.14E-08	/	1.00E-03	=	4.14E-05
Chromium	1.46E-06	x	0.00E+00	=	0.00E+00	4.08E-06	/	3.00E-03	=	1.36E-03
Cobalt	1.39E-06	x	0.00E+00	=	0.00E+00	3.89E-06	/	3.00E-04	=	1.30E-02
Copper	1.95E-06	x	0.00E+00	=	0.00E+00	5.46E-06	/	4.00E-02	=	1.37E-04
Fluoride	3.40E-07	x	0.00E+00	=	0.00E+00	9.52E-07	/	4.00E-02	=	2.38E-05
Iron	3.68E-03	x	0.00E+00	=	0.00E+00	1.03E-02	/	7.00E-01	=	1.47E-02
Lithium	1.27E-06	x	0.00E+00	=	0.00E+00	3.57E-06	/	2.00E-03	=	1.78E-03
Manganese	5.41E-05	x	0.00E+00	=	0.00E+00	1.52E-04	/	1.40E-01	=	1.08E-03
Nickel	1.66E-06	x	0.00E+00	=	0.00E+00	4.64E-06	/	2.00E-02	=	2.32E-04
Nitrate	1.39E-06	x	0.00E+00	=	0.00E+00	3.88E-06	/	7.10E+00	=	5.46E-07
Nitrite	1.41E-07	x	0.00E+00	=	0.00E+00	3.96E-07	/	3.00E-01	=	1.32E-06
Silver	7.38E-09	x	0.00E+00	=	0.00E+00	2.07E-08	/	5.00E-03	=	4.13E-06
Strontium	5.77E-06	x	0.00E+00	=	0.00E+00	1.62E-05	/	6.00E-01	=	2.69E-05
Tin	1.77E-06	x	0.00E+00	=	0.00E+00	4.97E-06	/	6.00E-01	=	8.28E-06
Total Uranium	8.82E-08	x	0.00E+00	=	0.00E+00	2.47E-07	/	3.00E-03	=	8.24E-05
Vanadium	9.17E-06	x	0.00E+00	=	0.00E+00	2.57E-05	/	5.00E-03	=	5.13E-03
Zinc	6.97E-06	x	0.00E+00	=	0.00E+00	1.95E-05	/	3.00E-01	=	6.51E-05
Diethylphthalate	5.20E-08	x	0.00E+00	=	0.00E+00	1.46E-07	/	8.00E-01	=	1.82E-07
Aroclor-1254	1.15E-09	x	2.00E+00	=	2.31E-09	3.23E-09	/	2.00E-05	=	1.61E-04
			Pathway total	=	8.62E-07			Pathway total	=	4.69E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**mg/m^3**		ug/mg		**unitless**
Aluminum	8.43E-06	x		=	NA	2.36E-05	/[	5.00E-03	x	1000	]=	4.72E-06
Antimony	2.96E-10	x		=	NA	8.30E-10	/[		x	1000	]=	NA
Arsenic	4.19E-09	x	4.30E-03	=	1.80E-11	1.17E-08	/[	1.50E-05	x	1000	]=	7.82E-07
Barium	9.49E-08	x		=	NA	2.66E-07	/[	5.00E-04	x	1000	]=	5.32E-07
Cadmium	1.08E-10	x	1.80E-03	=	1.94E-13	3.03E-10	/[	1.00E-05	x	1000	]=	3.03E-08
Chromium	1.07E-08	x	8.40E-02	=	8.95E-10	2.98E-08	/[	1.00E-04	x	1000	]=	2.98E-07
Cobalt	1.02E-08	x	9.00E-03	=	9.14E-11	2.84E-08	/[	6.00E-06	x	1000	]=	4.74E-06
Copper	1.42E-08	x		=	NA	3.99E-08	/[		x	1000	]=	NA
Fluoride	2.49E-09	x		=	NA	6.96E-09	/[	1.30E-02	x	1000	]=	5.35E-10
Iron	2.69E-05	x		=	NA	7.53E-05	/[		x	1000	]=	NA
Lithium	9.31E-09	x		=	NA	2.61E-08	/[		x	1000	]=	NA
Manganese	3.95E-07	x		=	NA	1.11E-06	/[	5.00E-05	x	1000	]=	2.21E-05
Nickel	1.21E-08	x	2.60E-04	=	3.15E-12	3.39E-08	/[	9.00E-05	x	1000	]=	3.77E-07
Nitrate	1.01E-08	x		=	NA	2.83E-08	/[		x	1000	]=	NA
Nitrite	1.03E-09	x		=	NA	2.89E-09	/[		x	1000	]=	NA
Silver	5.39E-11	x		=	NA	1.51E-10	/[		x	1000	]=	NA
Strontium	4.22E-08	x		=	NA	1.18E-07	/[		x	1000	]=	NA
Tin	1.30E-08	x		=	NA	3.63E-08	/[		x	1000	]=	NA
Total Uranium	6.45E-10	x		=	NA	1.81E-09	/[	4.00E-05	x	1000	]=	4.51E-08
Vanadium	6.70E-08	x		=	NA	1.88E-07	/[	1.00E-04	x	1000	]=	1.88E-06
Zinc	5.09E-08	x		=	NA	1.43E-07	/[		x	1000	]=	NA
Diethylphthalate	3.80E-10	x		=	NA	1.06E-09	/[		x	1000	]=	NA
Aroclor-1254	8.42E-12	x	5.70E-04	=	4.80E-15	2.36E-11	/[		x	1000	]=	NA
			Pathway total =		1.01E-09					Pathway total =		3.55E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.43E-07	x	1.50E+00	=	2.15E-07	4.01E-07	/	3.00E-04	=	1.34E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	1.23E-10	x		=	NA	3.45E-10	/	2.50E-05	=	1.38E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	4.33E-08	x		=	NA	1.21E-07	/	8.00E-01	=	1.52E-07
Aroclor-1254	1.34E-09	x	2.00E+00	=	2.69E-09	3.76E-09	/	2.00E-05	=	1.88E-04
			Pathway total =		**2.18E-07**			Pathway total =		1.54E-03

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Arsenic	Sum of all pathways	=	1.08E-06	Sum of all pathways	=	6.7E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Cadmium	Sum of all pathways	=	1.94E-13	Sum of all pathways	=	5.5E-05
Chromium	Sum of all pathways	=	8.95E-10	Sum of all pathways	=	1.4E-03
Cobalt	Sum of all pathways	=	9.14E-11	Sum of all pathways	=	1.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Nickel	Sum of all pathways	=	3.15E-12	Sum of all pathways	=	2.3E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-05
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-07
Aroclor-1254	Sum of all pathways	=	4.99E-09	Sum of all pathways	=	3.5E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.08E-06	All Pathways and Chemicals	=	4.85E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.45E-03	=	[	9.51E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	1.10E-07	=	[	7.21E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	3.24E-06	=	[	2.12E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.51E-05	=	[	9.88E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	6.16E-08	=	[	4.03E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	2.29E-08	=	[	1.50E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.96E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.68E-06	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	2.77E-06	=	[	1.81E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	3.50E-07	=	[	2.29E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	4.37E-03	=	[	2.86E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.85E-06	=	[	1.21E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	6.86E-05	=	[	4.49E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	7.74E-10	=	[	5.06E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.99E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	2.66E-06	=	[	1.74E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	3.23E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.22E-08	=	[	8.00E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	6.83E-06	=	[	4.47E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	1.29E-07	=	[	8.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	1.20E-05	=	[	7.85E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	7.81E-06	=	[	5.11E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.23E-08	=	[	8.07E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.07E-03	=	[	9.51E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	3.09E-07	=	[	7.21E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	9.08E-06	=	[	2.12E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	4.23E-05	=	[	9.88E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	1.73E-07	=	[	4.03E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	6.42E-08	=	[	1.50E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	5.48E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	4.71E-06	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	7.75E-06	=	[	1.81E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	9.80E-07	=	[	2.29E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.22E-02	=	[	2.86E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	5.18E-06	=	[	1.21E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.92E-04	=	[	4.49E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	2.17E-09	=	[	5.06E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	5.57E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	7.45E-06	=	[	1.74E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	9.03E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	3.42E-08	=	[	8.00E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.91E-05	=	[	4.47E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	3.62E-07	=	[	8.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	3.36E-05	=	[	7.85E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	2.19E-05	=	[	5.11E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	3.45E-08	=	[	8.07E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.06E-05	=	[	1.3E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	8.05E-10	=	[	9.9E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	2.37E-08	=	[	2.9E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	1.10E-07	=	[	1.4E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	4.50E-10	=	[	5.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.68E-10	=	[	2.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.43E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	1.23E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	2.02E-08	=	[	2.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	2.56E-09	=	[	3.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	3.19E-05	=	[	3.9E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	1.35E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	5.02E-07	=	[	6.2E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	5.65E-12	=	[	6.9E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.45E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.94E-08	=	[	2.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	2.36E-09	=	[	2.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	8.94E-11	=	[	1.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	4.99E-08	=	[	6.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	9.44E-10	=	[	1.2E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	8.77E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.71E-08	=	[	7.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.01E-11	=	[	1.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	2.97E-05	=	[1.3E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	2.25E-09	=	[9.9E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	6.63E-08	=	[2.9E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	3.09E-07	=	[1.4E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	1.26E-09	=	[5.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	4.69E-10	=	[2.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	4.00E-08	=	[1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	3.44E-08	=	[1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	5.66E-08	=	[2.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	7.16E-09	=	[3.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	8.94E-05	=	[3.9E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	3.78E-08	=	[1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.40E-06	=	[6.2E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	1.58E-11	=	[6.9E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	4.07E-08	=	[1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	5.44E-08	=	[2.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	6.60E-09	=	[2.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.50E-10	=	[1.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.40E-07	=	[6.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.64E-09	=	[1.2E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	2.46E-07	=	[1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.60E-07	=	[7.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	2.52E-10	=	[1.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	8.10E-07	=	[	2.12E+01	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.91E-10	=	[	1.50E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.03E-08	=	[	8.07E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	2.27E-06	=	[	2.12E+01	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	5.35E-10	=	[	1.50E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.88E-08	=	[	8.07E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.45E-03	x	0.00E+00	=	0.00E+00	4.07E-03	/	1.00E+00	=	4.07E-03
Antimony	1.10E-07	x	0.00E+00	=	0.00E+00	3.09E-07	/	4.00E-04	=	7.72E-04
Arsenic	3.24E-06	x	1.50E+00	=	4.86E-06	9.08E-06	/	3.00E-04	=	3.03E-02
Barium	1.51E-05	x	0.00E+00	=	0.00E+00	4.23E-05	/	2.00E-01	=	2.11E-04
Beryllium	6.16E-08	x	0.00E+00	=	0.00E+00	1.73E-07	/	2.00E-03	=	8.63E-05
Cadmium	2.29E-08	x	0.00E+00	=	0.00E+00	6.42E-08	/	1.00E-03	=	6.42E-05
Chromium	1.96E-06	x	0.00E+00	=	0.00E+00	5.48E-06	/	3.00E-03	=	1.83E-03
Cobalt	1.68E-06	x	0.00E+00	=	0.00E+00	4.71E-06	/	3.00E-04	=	1.57E-02
Copper	2.77E-06	x	0.00E+00	=	0.00E+00	7.75E-06	/	4.00E-02	=	1.94E-04
Fluoride	3.50E-07	x	0.00E+00	=	0.00E+00	9.80E-07	/	4.00E-02	=	2.45E-05
Iron	4.37E-03	x	0.00E+00	=	0.00E+00	1.22E-02	/	7.00E-01	=	1.75E-02
Lithium	1.85E-06	x	0.00E+00	=	0.00E+00	5.18E-06	/	2.00E-03	=	2.59E-03
Manganese	6.86E-05	x	0.00E+00	=	0.00E+00	1.92E-04	/	1.40E-01	=	1.37E-03
Mercury	7.74E-10	x	0.00E+00	=	0.00E+00	2.17E-09	/	0.00E+00	=	NA
Nickel	1.99E-06	x	0.00E+00	=	0.00E+00	5.57E-06	/	2.00E-02	=	2.78E-04
Nitrate	2.66E-06	x	0.00E+00	=	0.00E+00	7.45E-06	/	7.10E+00	=	1.05E-06
Nitrite	3.23E-07	x	0.00E+00	=	0.00E+00	9.03E-07	/	3.00E-01	=	3.01E-06
Silver	1.22E-08	x	0.00E+00	=	0.00E+00	3.42E-08	/	5.00E-03	=	6.85E-06
Strontium	6.83E-06	x	0.00E+00	=	0.00E+00	1.91E-05	/	6.00E-01	=	3.19E-05
Total Uranium	1.29E-07	x	0.00E+00	=	0.00E+00	3.62E-07	/	3.00E-03	=	1.21E-04
Vanadium	1.20E-05	x	0.00E+00	=	0.00E+00	3.36E-05	/	5.00E-03	=	6.72E-03
Zinc	7.81E-06	x	0.00E+00	=	0.00E+00	2.19E-05	/	3.00E-01	=	7.29E-05
Butylbenzylphthalate	1.23E-08	x	1.90E-03	=	2.34E-11	3.45E-08	/	2.00E-01	=	1.73E-07
			Pathway total	=	4.86E-06			Pathway total	=	8.19E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.06E-05	x		=	NA	2.97E-05	/[	5.00E-03	x	1000	]=	5.95E-06
Antimony	8.05E-10	x		=	NA	2.25E-09	/[		x	1000	]=	NA
Arsenic	2.37E-08	x	4.30E-03	=	1.02E-10	6.63E-08	/[	1.50E-05	x	1000	]=	4.42E-06
Barium	1.10E-07	x		=	NA	3.09E-07	/[	5.00E-04	x	1000	]=	6.18E-07
Beryllium	4.50E-10	x	2.40E-03	=	1.08E-12	1.26E-09	/[	2.00E-05	x	1000	]=	6.30E-08
Cadmium	1.68E-10	x	1.80E-03	=	3.02E-13	4.69E-10	/[	1.00E-05	x	1000	]=	4.69E-08
Chromium	1.43E-08	x	8.40E-02	=	1.20E-09	4.00E-08	/[	1.00E-04	x	1000	]=	4.00E-07
Cobalt	1.23E-08	x	9.00E-03	=	1.11E-10	3.44E-08	/[	6.00E-06	x	1000	]=	5.73E-06
Copper	2.02E-08	x		=	NA	5.66E-08	/[		x	1000	]=	NA
Fluoride	2.56E-09	x		=	NA	7.16E-09	/[	1.30E-02	x	1000	]=	5.51E-10
Iron	3.19E-05	x		=	NA	8.94E-05	/[		x	1000	]=	NA
Lithium	1.35E-08	x		=	NA	3.78E-08	/[		x	1000	]=	NA
Manganese	5.02E-07	x		=	NA	1.40E-06	/[	5.00E-05	x	1000	]=	2.81E-05
Mercury	5.65E-12	x	0.00E+00	=	0.00E+00	1.58E-11	/[	3.00E-04	x	1000	]=	5.28E-11
Nickel	1.45E-08	x	2.60E-04	=	3.78E-12	4.07E-08	/[	9.00E-05	x	1000	]=	4.52E-07
Nitrate	1.94E-08	x		=	NA	5.44E-08	/[		x	1000	]=	NA
Nitrite	2.36E-09	x		=	NA	6.60E-09	/[		x	1000	]=	NA
Silver	8.94E-11	x		=	NA	2.50E-10	/[		x	1000	]=	NA
Strontium	4.99E-08	x		=	NA	1.40E-07	/[		x	1000	]=	NA
Total Uranium	9.44E-10	x		=	NA	2.64E-09	/[	4.00E-05	x	1000	]=	6.61E-08
Vanadium	8.77E-08	x		=	NA	2.46E-07	/[	1.00E-04	x	1000	]=	2.46E-06
Zinc	5.71E-08	x				1.60E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	9.01E-11	x	0.00E+00	=	0.00E+00	2.52E-10	/		x	1000	]=	NA
			Pathway total =		1.42E-09					Pathway total =		4.83E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	8.10E-07	x	1.50E+00	=	1.21E-06	2.27E-06	/	3.00E-04	=	7.56E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.91E-10	x		=	NA	5.35E-10	/	2.50E-05	=	2.14E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.03E-08	x	1.90E-03	=	1.95E-11	2.88E-08	/	2.00E-01	=	1.44E-07
			Pathway total =		1.21E-06			Pathway total =		7.58E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-04
Arsenic	Sum of all pathways	=	6.08E-06	Sum of all pathways	=	3.8E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Beryllium	Sum of all pathways	=	1.08E-12	Sum of all pathways	=	8.6E-05
Cadmium	Sum of all pathways	=	3.02E-13	Sum of all pathways	=	8.6E-05
Chromium	Sum of all pathways	=	1.20E-09	Sum of all pathways	=	1.8E-03
Cobalt	Sum of all pathways	=	1.11E-10	Sum of all pathways	=	1.6E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-11
Nickel	Sum of all pathways	=	3.78E-12	Sum of all pathways	=	2.8E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-05
Butylbenzylphthalate	Sum of all pathways	=	4.30E-11	Sum of all pathways	=	3.2E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	6.08E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	8.95E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.13E-03	=	[	7.42E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	2.72E-08	=	[	1.78E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	7.95E-07	=	[	5.20E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.20E-05	=	[	7.84E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	2.43E-08	=	[	1.59E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Boron	5.11E-07	=	[	3.34E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	4.98E-07	=	[	3.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	2.63E-06	=	[	1.72E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.35E-06	=	[	8.82E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	2.52E-06	=	[	1.65E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	2.26E-07	=	[	1.48E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.70E-03	=	[	2.42E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.40E-06	=	[	9.13E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	7.57E-05	=	[	4.95E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	3.55E-09	=	[	2.32E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.90E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	7.67E-07	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	2.14E-07	=	[	1.40E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	8.56E-08	=	[	5.60E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.30E-08	=	[	8.50E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.31E-06	=	[	3.47E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	1.26E-07	=	[	8.27E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	8.99E-06	=	[	5.88E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	6.85E-06	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	1.01E-09	=	[	6.63E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.90E-08	=	[	1.24E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	5.15E-11	=	[	3.37E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Aldrin	3.06E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.18E-03	=	[	7.42E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	7.62E-08	=	[	1.78E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	2.23E-06	=	[	5.20E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.36E-05	=	[	7.84E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	6.81E-08	=	[	1.59E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Boron	1.43E-06	=	[	3.34E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	1.40E-06	=	[	3.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	7.36E-06	=	[	1.72E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.78E-06	=	[	8.82E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	7.06E-06	=	[	1.65E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	6.34E-07	=	[	1.48E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.04E-02	=	[	2.42E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.91E-06	=	[	9.13E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	2.12E-04	=	[	4.95E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	9.93E-09	=	[	2.32E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	5.31E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	2.15E-06	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	5.99E-07	=	[	1.40E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	2.40E-07	=	[	5.60E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	3.64E-08	=	[	8.50E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.49E-05	=	[	3.47E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	3.54E-07	=	[	8.27E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.52E-05	=	[	5.88E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.92E-05	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	2.84E-09	=	[	6.63E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	5.31E-08	=	[	1.24E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	1.44E-10	=	[	3.37E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Aldrin	8.56E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.29E-06	=	[	1.0E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.99E-10	=	[	2.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	5.81E-09	=	[	7.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	8.76E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.78E-10	=	[	2.2E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	3.73E-09	=	[	4.6E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	3.64E-09	=	[	4.5E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.92E-08	=	[	2.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	9.85E-09	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.84E-08	=	[	2.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.65E-09	=	[	2.0E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.70E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	1.02E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	5.53E-07	=	[	6.8E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	2.59E-11	=	[	3.2E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.39E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	5.61E-09	=	[	6.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.56E-09	=	[	1.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	6.26E-10	=	[	7.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	9.49E-11	=	[	1.2E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	3.88E-08	=	[	4.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	9.24E-10	=	[	1.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	6.57E-08	=	[	8.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.00E-08	=	[	6.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	7.41E-12	=	[	9.1E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.39E-10	=	[	1.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	3.76E-13	=	[	4.6E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aldrin	2.23E-12	=	[	2.7E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	2.32E-05	=	[1.0E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	5.57E-10	=	[2.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.63E-08	=	[7.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.45E-07	=	[1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	4.97E-10	=	[2.2E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	1.04E-08	=	[4.6E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.02E-08	=	[4.5E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	5.38E-08	=	[2.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.76E-08	=	[1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	5.16E-08	=	[2.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	4.63E-09	=	[2.0E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.57E-05	=	[3.3E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.86E-08	=	[1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.55E-06	=	[6.8E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	7.26E-11	=	[3.2E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.88E-08	=	[1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.57E-08	=	[6.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	4.38E-09	=	[1.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	1.75E-09	=	[7.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.66E-10	=	[1.2E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.09E-07	=	[4.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.59E-09	=	[1.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.84E-07	=	[8.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.40E-07	=	[6.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	2.07E-11	=	[9.1E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	3.88E-10	=	[1.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.05E-12	=	[4.6E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aldrin	6.26E-12	=	[2.7E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.99E-07	=	[	5.20E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	4.15E-09	=	[	3.26E+00	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.58E-08	=	[	1.24E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Aldrin	2.55E-10	=	[	2.00E-03	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	5.56E-07	=	[	5.20E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	1.16E-08	=	[	3.26E+00	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	4.42E-08	=	[	1.24E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Aldrin	7.13E-10	=	[	2.00E-03	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.13E-03	x	0.00E+00	=	0.00E+00	3.18E-03	/	1.00E+00	=	3.18E-03
Antimony	2.72E-08	x	0.00E+00	=	0.00E+00	7.62E-08	/	4.00E-04	=	1.90E-04
Arsenic	7.95E-07	x	1.50E+00	=	1.19E-06	2.23E-06	/	3.00E-04	=	7.42E-03
Barium	1.20E-05	x	0.00E+00	=	0.00E+00	3.36E-05	/	2.00E-01	=	1.68E-04
Beryllium	2.43E-08	x	0.00E+00	=	0.00E+00	6.81E-08	/	2.00E-03	=	3.40E-05
Boron	5.11E-07	x	0.00E+00	=	0.00E+00	1.43E-06	/	2.00E-01	=	7.15E-06
Cadmium	4.98E-07	x	0.00E+00	=	0.00E+00	1.40E-06	/	1.00E-03	=	1.40E-03
Chromium	2.63E-06	x	0.00E+00	=	0.00E+00	7.36E-06	/	3.00E-03	=	2.45E-03
Cobalt	1.35E-06	x	0.00E+00	=	0.00E+00	3.78E-06	/	3.00E-04	=	1.26E-02
Copper	2.52E-06	x	0.00E+00	=	0.00E+00	7.06E-06	/	4.00E-02	=	1.77E-04
Fluoride	2.26E-07	x	0.00E+00	=	0.00E+00	6.34E-07	/	4.00E-02	=	1.58E-05
Iron	3.70E-03	x	0.00E+00	=	0.00E+00	1.04E-02	/	7.00E-01	=	1.48E-02
Lithium	1.40E-06	x	0.00E+00	=	0.00E+00	3.91E-06	/	2.00E-03	=	1.95E-03
Manganese	7.57E-05	x	0.00E+00	=	0.00E+00	2.12E-04	/	1.40E-01	=	1.51E-03
Mercury	3.55E-09	x	0.00E+00	=	0.00E+00	9.93E-09	/	0.00E+00	=	NA
Nickel	1.90E-06	x	0.00E+00	=	0.00E+00	5.31E-06	/	2.00E-02	=	2.65E-04
Nitrate	7.67E-07	x	0.00E+00	=	0.00E+00	2.15E-06	/	7.10E+00	=	3.03E-07
Nitrite	2.14E-07	x	0.00E+00	=	0.00E+00	5.99E-07	/	3.00E-01	=	2.00E-06
Selenium	8.56E-08	x	0.00E+00	=	0.00E+00	2.40E-07	/	5.00E-03	=	4.79E-05
Silver	1.30E-08	x	0.00E+00	=	0.00E+00	3.64E-08	/	5.00E-03	=	7.28E-06
Strontium	5.31E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	6.00E-01	=	2.48E-05
Total Uranium	1.26E-07	x	0.00E+00	=	0.00E+00	3.54E-07	/	3.00E-03	=	1.18E-04
Vanadium	8.99E-06	x	0.00E+00	=	0.00E+00	2.52E-05	/	5.00E-03	=	5.03E-03
Zinc	6.85E-06	x	0.00E+00	=	0.00E+00	1.92E-05	/	3.00E-01	=	6.39E-05
Acetone	1.01E-09	x	0.00E+00	=	0.00E+00	2.84E-09	/	9.00E-01	=	3.15E-09
Butylbenzylphthalate	1.90E-08	x	1.90E-03	=	3.60E-11	5.31E-08	/	2.00E-01	=	2.65E-07
Toluene	5.15E-11	x	0.00E+00	=	0.00E+00	1.44E-10	/	8.00E-02	=	1.80E-09
Aldrin	3.06E-10	x	1.70E+01	=	5.20E-09	8.56E-10	/	3.00E-05	=	2.85E-05
			Pathway total	=	1.20E-06			Pathway total	=	5.15E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.29E-06	x		=	NA	2.32E-05	/[	5.00E-03	x	1000	]=	4.64E-06
Antimony	1.99E-10	x		=	NA	5.57E-10	/[		x	1000	]=	NA
Arsenic	5.81E-09	x	4.30E-03	=	2.50E-11	1.63E-08	/[	1.50E-05	x	1000	]=	1.08E-06
Barium	8.76E-08	x		=	NA	2.45E-07	/[	5.00E-04	x	1000	]=	4.90E-07
Beryllium	1.78E-10	x	2.40E-03	=	4.26E-13	4.97E-10	/[	2.00E-05	x	1000	]=	2.49E-08
Boron	3.73E-09	x	0.00E+00	=	0.00E+00	1.04E-08	/[	2.00E-02	x	1000	]=	5.22E-10
Cadmium	3.64E-09	x	1.80E-03	=	6.55E-12	1.02E-08	/[	1.00E-05	x	1001	]=	1.02E-06
Chromium	1.92E-08	x	8.40E-02	=	1.61E-09	5.38E-08	/[	1.00E-04	x	1002	]=	5.37E-07
Cobalt	9.85E-09	x	9.00E-03	=	8.87E-11	2.76E-08	/[	6.00E-06	x	1003	]=	4.58E-06
Copper	1.84E-08	x		=	NA	5.16E-08	/[		x	1004	]=	NA
Fluoride	1.65E-09	x		=	NA	4.63E-09	/[	1.30E-02	x	1005	]=	3.54E-10
Iron	2.70E-05	x		=	NA	7.57E-05	/[		x	1000	]=	NA
Lithium	1.02E-08	x		=	NA	2.86E-08	/[		x	1000	]=	NA
Manganese	5.53E-07	x		=	NA	1.55E-06	/[	5.00E-05	x	1000	]=	3.10E-05
Mercury	2.59E-11	x	0.00E+00	=	0.00E+00	7.26E-11	/[	3.00E-04	x	1000	]=	2.42E-10
Nickel	1.39E-08	x	2.60E-04	=	3.60E-12	3.88E-08	/[	9.00E-05	x	1000	]=	4.31E-07
Nitrate	5.61E-09	x		=	NA	1.57E-08	/[		x	1000	]=	NA
Nitrite	1.56E-09	x		=	NA	4.38E-09	/[		x	1000	]=	NA
Selenium	6.26E-10	x	0.00E+00	=	0.00E+00	1.75E-09	/[	2.00E-02	x	1000	]=	8.76E-11
Silver	9.49E-11	x		=	NA	2.66E-10	/[		x	1000	]=	NA
Strontium	3.88E-08	x		=	NA	1.09E-07	/[		x	1000	]=	NA
Total Uranium	9.24E-10	x		=	NA	2.59E-09	/[	4.00E-05	x	1000	]=	6.47E-08
Vanadium	6.57E-08	x		=	NA	1.84E-07	/[	1.00E-04	x	1000	]=	1.84E-06
Zinc	5.00E-08	x		=	NA	1.40E-07	/[		x	1000	]=	NA
Acetone	7.41E-12	x	0.00E+00	=	0.00E+00	2.07E-11	/[	3.10E+01	x	1000	]=	6.69E-16
Butylbenzylphthalate	1.39E-10	x	0.00E+00	=	0.00E+00	3.88E-10	/[		x	1000	]=	NA
Toluene	3.76E-13	x	0.00E+00	=	0.00E+00	1.05E-12	/[	5.00E+00	x	1000	]=	2.11E-16
Aldrin	2.23E-12	x	4.90E-03	=	1.09E-14	6.26E-12	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.74E-09					Pathway total =		4.57E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.99E-07	x	1.50E+00	=	2.98E-07	5.56E-07	/	3.00E-04	=	1.85E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	4.15E-09	x		=	NA	1.16E-08	/	2.50E-05	=	4.65E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.58E-08	x	1.90E-03	=	3.00E-11	4.42E-08	/	2.00E-01	=	2.21E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	2.55E-10	x	1.70E+01	=	4.33E-09	7.13E-10	/	3.00E-05	=	2.38E-05
			Pathway total =		3.02E-07			Pathway total =		2.34E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Arsenic	Sum of all pathways	=	1.49E-06	Sum of all pathways	=	9.3E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Beryllium	Sum of all pathways	=	4.26E-13	Sum of all pathways	=	3.4E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-06
Cadmium	Sum of all pathways	=	6.55E-12	Sum of all pathways	=	1.9E-03
Chromium	Sum of all pathways	=	1.61E-09	Sum of all pathways	=	2.5E-03
Cobalt	Sum of all pathways	=	8.87E-11	Sum of all pathways	=	1.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-10
Nickel	Sum of all pathways	=	3.60E-12	Sum of all pathways	=	2.7E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-09
Butylbenzylphthalate	Sum of all pathways	=	6.60E-11	Sum of all pathways	=	4.9E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-09
Aldrin	Sum of all pathways	=	9.53E-09	Sum of all pathways	=	5.2E-05

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2E-06	All Pathways and Chemicals	=	5.39E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.03E-03	=	[	6.76E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	3.78E-08	=	[	2.47E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	5.33E-07	=	[	3.49E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.44E-05	=	[	9.41E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	4.56E-08	=	[	2.98E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.78E-08	=	[	1.17E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.37E-06	=	[	8.98E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.25E-06	=	[	8.18E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	1.99E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	3.23E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.66E-03	=	[	2.39E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.14E-06	=	[	7.43E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.91E-05	=	[	3.86E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	4.65E-09	=	[	3.04E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.72E-06	=	[	1.13E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.09E-06	=	[	7.15E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	4.68E-07	=	[	3.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.25E-08	=	[	8.18E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.53E-06	=	[	3.62E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Tin	9.72E-07	=	[	6.36E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	1.09E-07	=	[	7.15E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	1.07E-05	=	[	6.97E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	5.86E-06	=	[	3.83E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
2-Butanone	3.80E-10	=	[	2.48E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.17E-07	=	[	4.03E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	9.06E-09	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Hexane	5.49E-09	=	[	3.59E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	3.06E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
o-Xylene	1.96E-11	=	[	1.28E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	1.00E-10	=	[	6.54E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	1.50E-10	=	[	9.78E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Xylenes (total)	7.08E-11	=	[	4.63E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	3.86E-09	=	[	2.52E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Gamma-BHC (Lindane)	7.80E-10	=	[	5.10E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1260	3.15E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	2.89E-03	=	[	6.76E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.06E-07	=	[	2.47E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	1.49E-06	=	[	3.49E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	4.03E-05	=	[	9.41E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	1.28E-07	=	[	2.98E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.99E-08	=	[	1.17E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	3.84E-06	=	[	8.98E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.50E-06	=	[	8.18E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.58E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	9.04E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.03E-02	=	[	2.39E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.18E-06	=	[	7.43E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.65E-04	=	[	3.86E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	1.30E-08	=	[	3.04E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	4.82E-06	=	[	1.13E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	3.06E-06	=	[	7.15E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	1.31E-06	=	[	3.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	3.50E-08	=	[	8.18E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.55E-05	=	[	3.62E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Tin	2.72E-06	=	[	6.36E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	3.06E-07	=	[	7.15E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.99E-05	=	[	6.97E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.64E-05	=	[	3.83E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
2-Butanone	1.06E-09	=	[	2.48E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	1.73E-06	=	[	4.03E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.54E-08	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Hexane	1.54E-08	=	[	3.59E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	8.56E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
o-Xylene	5.48E-11	=	[	1.28E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	2.80E-10	=	[	6.54E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	4.19E-10	=	[	9.78E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Xylenes (total)	1.98E-10	=	[	4.63E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	1.08E-08	=	[	2.52E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Gamma-BHC (Lindane)	2.18E-09	=	[	5.10E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1260	8.82E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.55E-06	=	[	9.3E-05	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.76E-10	=	[	3.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	3.90E-09	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	1.05E-07	=	[	1.3E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	3.33E-10	=	[	4.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.30E-10	=	[	1.6E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.00E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	9.14E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.46E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	2.36E-09	=	[	2.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.67E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	8.30E-09	=	[	1.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.31E-07	=	[	5.3E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	3.40E-11	=	[	4.2E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.26E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	7.99E-09	=	[	9.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	3.42E-09	=	[	4.2E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	9.14E-11	=	[	1.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	4.04E-08	=	[	5.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	7.10E-09	=	[	8.7E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	7.99E-10	=	[	9.8E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	7.79E-08	=	[	9.6E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	4.28E-08	=	[	5.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
2-Butanone	2.78E-12	=	[	3.4E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	4.50E-09	=	[	5.5E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.62E-11	=	[	8.1E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Hexane	4.01E-11	=	[	4.9E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	2.23E-12	=	[	2.7E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
o-Xylene	1.43E-13	=	[	1.8E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	7.31E-13	=	[	9.0E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	1.09E-12	=	[	1.3E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.17E-13	=	[	6.3E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	2.82E-11	=	[	3.5E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	5.70E-12	=	[	7.0E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.30E-11	=	[	2.8E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	2.11E-05	=	[	9.3E-05	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	7.73E-10	=	[	3.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.09E-08	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.94E-07	=	[	1.3E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	9.32E-10	=	[	4.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	3.64E-10	=	[	1.6E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.81E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.56E-08	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	4.08E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	6.61E-09	=	[	2.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.49E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.32E-08	=	[	1.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.21E-06	=	[	5.3E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	9.51E-11	=	[	4.2E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.52E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.24E-08	=	[	9.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	9.57E-09	=	[	4.2E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.56E-10	=	[	1.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.13E-07	=	[	5.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	1.99E-08	=	[	8.7E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.24E-09	=	[	9.8E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	2.18E-07	=	[	9.6E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.20E-07	=	[	5.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
2-Butanone	7.77E-12	=	[	3.4E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	1.26E-08	=	[	5.5E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.85E-10	=	[	8.1E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Hexane	1.12E-10	=	[	4.9E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	6.26E-12	=	[	2.7E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
o-Xylene	4.00E-13	=	[	1.8E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	2.05E-12	=	[	9.0E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	3.06E-12	=	[	1.3E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Xylenes (total)	1.45E-12	=	[	6.3E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	7.89E-11	=	[	3.5E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Gamma-BHC (Lindane)	1.60E-11	=	[	7.0E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1260	6.44E-11	=	[	2.8E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.33E-07	=	[	3.49E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.48E-10	=	[	1.17E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.13E-07	=	[	4.03E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	7.54E-09	=	[	5.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	3.21E-09	=	[	2.52E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Gamma-BHC (Lindane)	2.60E-10	=	[	5.10E-03	x	1.00E-06	x	3,470	x	0.12	x	0.04	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1260	3.67E-09	=	[	2.06E-02	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	3.73E-07	=	[	3.49E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.15E-10	=	[	1.17E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	1.44E-06	=	[	4.03E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.11E-08	=	[	5.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	9.00E-09	=	[	2.52E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Gamma-BHC (Lindane)	7.27E-10	=	[	5.10E-03	x	1.00E-06	x	3,470	x	0.12	x	0.04	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1260	1.03E-08	=	[	2.06E-02	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight

AF =soil to skin adherence factor
ABS = absorption factor
AT = averaging time

Risk Characterization

Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.03E-03	x	0.00E+00	=	0.00E+00	2.89E-03	/	1.00E+00	=	2.89E-03
Antimony	3.78E-08	x	0.00E+00	=	0.00E+00	1.06E-07	/	4.00E-04	=	2.64E-04
Arsenic	5.33E-07	x	1.50E+00	=	8.00E-07	1.49E-06	/	3.00E-04	=	4.98E-03
Barium	1.44E-05	x	0.00E+00	=	0.00E+00	4.03E-05	/	2.00E-01	=	2.01E-04
Beryllium	4.56E-08	x	0.00E+00	=	0.00E+00	1.28E-07	/	2.00E-03	=	6.38E-05
Cadmium	1.78E-08	x	0.00E+00	=	0.00E+00	4.99E-08	/	1.00E-03	=	4.99E-05
Chromium	1.37E-06	x	0.00E+00	=	0.00E+00	3.84E-06	/	3.00E-03	=	1.28E-03
Cobalt	1.25E-06	x	0.00E+00	=	0.00E+00	3.50E-06	/	3.00E-04	=	1.17E-02
Copper	1.99E-06	x	0.00E+00	=	0.00E+00	5.58E-06	/	4.00E-02	=	1.39E-04
Fluoride	3.23E-07	x	0.00E+00	=	0.00E+00	9.04E-07	/	4.00E-02	=	2.26E-05
Iron	3.66E-03	x	0.00E+00	=	0.00E+00	1.03E-02	/	7.00E-01	=	1.46E-02
Lithium	1.14E-06	x	0.00E+00	=	0.00E+00	3.18E-06	/	2.00E-03	=	1.59E-03
Manganese	5.91E-05	x	0.00E+00	=	0.00E+00	1.65E-04	/	1.40E-01	=	1.18E-03
Mercury	4.65E-09	x	0.00E+00	=	0.00E+00	1.30E-08	/	0.00E+00	=	NA
Nickel	1.72E-06	x	0.00E+00	=	0.00E+00	4.82E-06	/	2.00E-02	=	2.41E-04
Nitrate	1.09E-06	x	0.00E+00	=	0.00E+00	3.06E-06	/	7.10E+00	=	4.31E-07
Nitrite	4.68E-07	x	0.00E+00	=	0.00E+00	1.31E-06	/	3.00E-01	=	4.37E-06
Silver	1.25E-08	x	0.00E+00	=	0.00E+00	3.50E-08	/	5.00E-03	=	7.00E-06
Strontium	5.53E-06	x	0.00E+00	=	0.00E+00	1.55E-05	/	6.00E-01	=	2.58E-05
Tin	9.72E-07	x	0.00E+00	=	0.00E+00	2.72E-06	/	6.00E-01	=	4.54E-06
Total Uranium	1.09E-07	x	0.00E+00	=	0.00E+00	3.06E-07	/	3.00E-03	=	1.02E-04
Vanadium	1.07E-05	x	0.00E+00	=	0.00E+00	2.99E-05	/	5.00E-03	=	5.97E-03
Zinc	5.86E-06	x	0.00E+00	=	0.00E+00	1.64E-05	/	3.00E-01	=	5.47E-05
2-Butanone	3.80E-10	x	0.00E+00	=	0.00E+00	1.06E-09	/	6.00E-01	=	1.77E-09
Bis(2-ethylhexyl) phthalate	6.17E-07	x	1.40E-02	=	8.63E-09	1.73E-06	/	2.00E-02	=	8.63E-05
Butylbenzylphthalate	9.06E-09	x	1.90E-03	=	1.72E-11	2.54E-08	/	2.00E-01	=	1.27E-07
Hexane	5.49E-09	x	0.00E+00	=	0.00E+00	1.54E-08	/	6.00E-02	=	2.56E-07
Methylene chloride	3.06E-10	x	2.00E-03	=	6.12E-13	8.56E-10	/	6.00E-03	=	1.43E-07
o-Xylene	1.96E-11	x	0.00E+00	=	0.00E+00	5.48E-11	/	2.00E-01	=	2.74E-10
Styrene	1.00E-10	x	0.00E+00	=	0.00E+00	2.80E-10	/	2.00E-01	=	1.40E-09
Toluene	1.50E-10	x	0.00E+00	=	0.00E+00	4.19E-10	/	8.00E-02	=	5.23E-09
Xylenes (total)	7.08E-11	x	0.00E+00	=	0.00E+00	1.98E-10	/	2.00E-01	=	9.91E-10
beta-BHC	3.86E-09	x	1.80E+00	=	6.95E-09	1.08E-08	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	7.80E-10	x	1.10E+00	=	8.58E-10	2.18E-09	/	3.00E-04	=	7.28E-06
Aroclor-1260	3.15E-09	x	2.00E+00	=	6.30E-09	8.82E-09	/	0.00E+00	=	NA
			Pathway total	=	8.23E-07			Pathway total	=	4.55E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.55E-06	x		=	NA	2.11E-05	/[	5.00E-03	x	1000	]=	4.23E-06
Antimony	2.76E-10	x		=	NA	7.73E-10	/[		x	1000	]=	NA
Arsenic	3.90E-09	x	4.30E-03	=	1.68E-11	1.09E-08	/[	1.50E-05	x	1000	]=	7.27E-07
Barium	1.05E-07	x		=	NA	2.94E-07	/[	5.00E-04	x	1000	]=	5.89E-07
Beryllium	3.33E-10	x	2.40E-03	=	7.99E-13	9.32E-10	/[	2.00E-05	x	1000	]=	4.66E-08
Cadmium	1.30E-10	x	1.80E-03	=	2.34E-13	3.64E-10	/[	1.00E-05	x	1000	]=	3.64E-08
Chromium	1.00E-08	x	8.40E-02	=	8.42E-10	2.81E-08	/[	1.00E-04	x	1000	]=	2.81E-07
Cobalt	9.14E-09	x	9.00E-03	=	8.23E-11	2.56E-08	/[	6.00E-06	x	1000	]=	4.27E-06
Copper	1.46E-08	x		=	NA	4.08E-08	/[		x	1000	]=	NA
Fluoride	2.36E-09	x		=	NA	6.61E-09	/[	1.30E-02	x	1000	]=	5.08E-10
Iron	2.67E-05	x		=	NA	7.49E-05	/[		x	1000	]=	NA
Lithium	8.30E-09	x		=	NA	2.32E-08	/[		x	1000	]=	NA
Manganese	4.31E-07	x		=	NA	1.21E-06	/[	5.00E-05	x	1000	]=	2.42E-05
Mercury	3.40E-11	x	0.00E+00	=	0.00E+00	9.51E-11	/[	3.00E-04	x	1000	]=	3.17E-10
Nickel	1.26E-08	x	2.60E-04	=	3.27E-12	3.52E-08	/[	9.00E-05	x	1000	]=	3.91E-07
Nitrate	7.99E-09	x		=	NA	2.24E-08	/[		x	1000	]=	NA
Nitrite	3.42E-09	x		=	NA	9.57E-09	/[		x	1000	]=	NA
Silver	9.14E-11	x		=	NA	2.56E-10	/[		x	1000	]=	NA
Strontium	4.04E-08	x		=	NA	1.13E-07	/[		x	1000	]=	NA
Tin	7.10E-09	x		=	NA	1.99E-08	/[		x	1000	]=	NA
Total Uranium	7.99E-10	x		=	NA	2.24E-09	/[	4.00E-05	x	1000	]=	5.59E-08
Vanadium	7.79E-08	x		=	NA	2.18E-07	/[	1.00E-04	x	1000	]=	2.18E-06
Zinc	4.28E-08	x		=	NA	1.20E-07	/[		x	1000	]=	NA
2-Butanone	2.78E-12	x	0.00E+00	=	0.00E+00	7.77E-12	/[	5.00E+00	x	1000	]=	1.55E-15
Bis(2-ethylhexyl) phthalate	4.50E-09	x	2.40E-06	=	1.08E-14	1.26E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.62E-11	x	0.00E+00	=	0.00E+00	1.85E-10	/[		x	1000	]=	NA
Hexane	4.01E-11	x	0.00E+00	=	0.00E+00	1.12E-10	/[	7.00E-01	x	1000	]=	1.60E-13
Methylene chloride	2.23E-12	x	1.00E-08	=	2.23E-20	6.26E-12	/[	6.00E-01	x	1000	]=	1.04E-14
o-Xylene	1.43E-13	x	0.00E+00	=	0.00E+00	4.00E-13	/[	1.00E-01	x	1000	]=	4.00E-15
Styrene	7.31E-13	x	0.00E+00	=	0.00E+00	2.05E-12	/[	1.00E+00	x	1000	]=	2.05E-15
Toluene	1.09E-12	x	0.00E+00	=	0.00E+00	3.06E-12	/[	5.00E+00	x	1000	]=	6.12E-16
Xylenes (total)	5.17E-13	x	0.00E+00	=	0.00E+00	1.45E-12	/[	1.00E-01	x	1000	]=	1.45E-14
beta-BHC	2.82E-11	x	5.30E-04	=	1.49E-14	7.89E-11	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	5.70E-12	x	3.10E-04	=	1.77E-15	1.60E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.30E-11	x	5.70E-04	=	1.31E-14	6.44E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.46E-10					Pathway total =		3.70E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.33E-07	x	1.50E+00	=	2.00E-07	3.73E-07	/	3.00E-04	=	1.24E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.48E-10	x		=	NA	4.15E-10	/	2.50E-05	=	1.66E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	5.13E-07	x	1.40E-02	=	7.19E-09	1.44E-06	/	2.00E-02	=	7.19E-05
Butylbenzylphthalate	7.54E-09	x	1.90E-03	=	1.43E-11	2.11E-08	/	2.00E-01	=	1.06E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	3.21E-09	x	1.80E+00	=	5.78E-09	9.00E-09	/		=	NA
Gamma-BHC (Lindane)	2.60E-10	x	1.10E+00	=	2.86E-10	7.27E-10	/	3.00E-04	=	2.42E-06
Aroclor-1260	3.67E-09	x	2.00E+00	=	7.34E-09	1.03E-08	/		=	NA
			Pathway total =		**2.20E-07**			Pathway total =		1.33E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Arsenic	Sum of all pathways	=	1.00E-06	Sum of all pathways	=	6.2E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Beryllium	Sum of all pathways	=	7.99E-13	Sum of all pathways	=	6.4E-05
Cadmium	Sum of all pathways	=	2.34E-13	Sum of all pathways	=	6.7E-05
Chromium	Sum of all pathways	=	8.42E-10	Sum of all pathways	=	1.3E-03
Cobalt	Sum of all pathways	=	8.23E-11	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-10
Nickel	Sum of all pathways	=	3.27E-12	Sum of all pathways	=	2.4E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-05
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.58E-08	Sum of all pathways	=	1.6E-04
Butylbenzylphthalate	Sum of all pathways	=	3.15E-11	Sum of all pathways	=	2.3E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-07
Methylene chloride	Sum of all pathways	=	6.12E-13	Sum of all pathways	=	1.4E-07
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-10
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-09
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	9.9E-10
beta-BHC	Sum of all pathways	=	1.27E-08	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	1.14E-09	Sum of all pathways	=	9.7E-06
Aroclor-1260	Sum of all pathways	=	1.36E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk		
All Pathways and Chemicals	=	1E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	4.69E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.07E-03	=	[	7.01E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	3.91E-08	=	[	2.56E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	7.67E-07	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.38E-05	=	[	9.05E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	3.04E-08	=	[	1.99E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	2.10E-08	=	[	1.37E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	2.57E-06	=	[	1.68E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.56E-06	=	[	1.02E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	1.86E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	2.53E-07	=	[	1.66E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.99E-03	=	[	2.61E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.16E-06	=	[	7.56E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	6.24E-05	=	[	4.08E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	3.06E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	2.00E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	4.96E-06	=	[	3.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	1.99E-07	=	[	1.30E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	1.50E-07	=	[	9.83E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.00E-08	=	[	6.55E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.11E-06	=	[	3.34E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	8.34E-08	=	[	5.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	1.01E-05	=	[	6.61E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	6.85E-06	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	3.06E-08	=	[	2.00E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Di-n-butylphthalate	8.71E-08	=	[	5.70E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	6.02E-11	=	[	3.94E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	9.45E-11	=	[	6.18E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.00E-03	=	[	7.01E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.10E-07	=	[	2.56E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	2.15E-06	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.87E-05	=	[	9.05E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	8.51E-08	=	[	1.99E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	5.88E-08	=	[	1.37E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	7.19E-06	=	[	1.68E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	4.36E-06	=	[	1.02E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.22E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	7.09E-07	=	[	1.66E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.12E-02	=	[	2.61E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.24E-06	=	[	7.56E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.75E-04	=	[	4.08E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	8.56E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	5.60E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	1.39E-05	=	[	3.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	5.56E-07	=	[	1.30E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	4.21E-07	=	[	9.83E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	2.80E-08	=	[	6.55E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.43E-05	=	[	3.34E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.33E-07	=	[	5.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.83E-05	=	[	6.61E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.92E-05	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	8.56E-08	=	[	2.00E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Di-n-butylphthalate	2.44E-07	=	[	5.70E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	1.69E-10	=	[	3.94E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	2.65E-10	=	[	6.18E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.82E-06	=	[	9.6E-05	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.86E-10	=	[	3.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	5.61E-09	=	[	6.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	1.01E-07	=	[	1.2E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	2.22E-10	=	[	2.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.54E-10	=	[	1.9E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.88E-08	=	[	2.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	1.14E-08	=	[	1.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.36E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.85E-09	=	[	2.3E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.91E-05	=	[	3.6E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	8.45E-09	=	[	1.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.56E-07	=	[	5.6E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	2.23E-09	=	[	2.7E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.46E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	3.62E-08	=	[	4.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.45E-09	=	[	1.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	1.10E-09	=	[	1.3E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	7.31E-11	=	[	9.0E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	3.73E-08	=	[	4.6E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	6.09E-10	=	[	7.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	7.39E-08	=	[	9.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.00E-08	=	[	6.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.23E-10	=	[	2.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	6.37E-10	=	[	7.8E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	4.40E-13	=	[	5.4E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	6.90E-13	=	[	8.5E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	2.19E-05	=	[9.6E-05	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	8.00E-10	=	[3.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.57E-08	=	[6.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.83E-07	=	[1.2E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	6.22E-10	=	[2.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	4.30E-10	=	[1.9E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	5.25E-08	=	[2.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	3.18E-08	=	[1.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	3.81E-08	=	[1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	5.18E-09	=	[2.3E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	8.16E-05	=	[3.6E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.37E-08	=	[1.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.28E-06	=	[5.6E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	6.26E-09	=	[2.7E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	4.09E-08	=	[1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.01E-07	=	[4.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	4.06E-09	=	[1.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	3.07E-09	=	[1.3E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.05E-10	=	[9.0E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.04E-07	=	[4.6E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.71E-09	=	[7.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	2.07E-07	=	[9.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.40E-07	=	[6.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	6.26E-10	=	[2.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Di-n-butylphthalate	1.78E-09	=	[7.8E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	1.23E-12	=	[5.4E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.93E-12	=	[8.5E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.92E-07	=	[	5.02E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.75E-10	=	[	1.37E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.55E-08	=	[	2.00E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Di-n-butylphthalate	7.26E-08	=	[	5.70E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	5.37E-07	=	[	5.02E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.90E-10	=	[	1.37E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	7.13E-08	=	[	2.00E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Di-n-butylphthalate	2.03E-07	=	[	5.70E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.07E-03	x	0.00E+00	=	0.00E+00	3.00E-03	/	1.00E+00	=	3.00E-03
Antimony	3.91E-08	x	0.00E+00	=	0.00E+00	1.10E-07	/	4.00E-04	=	2.74E-04
Arsenic	7.67E-07	x	1.50E+00	=	1.15E-06	2.15E-06	/	3.00E-04	=	7.16E-03
Barium	1.38E-05	x	0.00E+00	=	0.00E+00	3.87E-05	/	2.00E-01	=	1.94E-04
Beryllium	3.04E-08	x	0.00E+00	=	0.00E+00	8.51E-08	/	2.00E-03	=	4.25E-05
Cadmium	2.10E-08	x	0.00E+00	=	0.00E+00	5.88E-08	/	1.00E-03	=	5.88E-05
Chromium	2.57E-06	x	0.00E+00	=	0.00E+00	7.19E-06	/	3.00E-03	=	2.40E-03
Cobalt	1.56E-06	x	0.00E+00	=	0.00E+00	4.36E-06	/	3.00E-04	=	1.45E-02
Copper	1.86E-06	x	0.00E+00	=	0.00E+00	5.22E-06	/	4.00E-02	=	1.30E-04
Fluoride	2.53E-07	x	0.00E+00	=	0.00E+00	7.09E-07	/	4.00E-02	=	1.77E-05
Iron	3.99E-03	x	0.00E+00	=	0.00E+00	1.12E-02	/	7.00E-01	=	1.60E-02
Lithium	1.16E-06	x	0.00E+00	=	0.00E+00	3.24E-06	/	2.00E-03	=	1.62E-03
Manganese	6.24E-05	x	0.00E+00	=	0.00E+00	1.75E-04	/	1.40E-01	=	1.25E-03
Molybdenum	3.06E-07	x	0.00E+00	=	0.00E+00	8.56E-07	/	5.00E-03	=	1.71E-04
Nickel	2.00E-06	x	0.00E+00	=	0.00E+00	5.60E-06	/	2.00E-02	=	2.80E-04
Nitrate	4.96E-06	x	0.00E+00	=	0.00E+00	1.39E-05	/	7.10E+00	=	1.96E-06
Nitrite	1.99E-07	x	0.00E+00	=	0.00E+00	5.56E-07	/	3.00E-01	=	1.85E-06
Selenium	1.50E-07	x	0.00E+00	=	0.00E+00	4.21E-07	/	5.00E-03	=	8.41E-05
Silver	1.00E-08	x	0.00E+00	=	0.00E+00	2.80E-08	/	5.00E-03	=	5.61E-06
Strontium	5.11E-06	x	0.00E+00	=	0.00E+00	1.43E-05	/	6.00E-01	=	2.38E-05
Total Uranium	8.34E-08	x	0.00E+00	=	0.00E+00	2.33E-07	/	3.00E-03	=	7.78E-05
Vanadium	1.01E-05	x	0.00E+00	=	0.00E+00	2.83E-05	/	5.00E-03	=	5.66E-03
Zinc	6.85E-06	x	0.00E+00	=	0.00E+00	1.92E-05	/	3.00E-01	=	6.39E-05
Butylbenzylphthalate	3.06E-08	x	1.90E-03	=	5.81E-11	8.56E-08	/	2.00E-01	=	4.28E-07
Di-n-butylphthalate	8.71E-08	x	0.00E+00	=	0.00E+00	2.44E-07	/	1.00E-01	=	2.44E-06
Styrene	6.02E-11	x	0.00E+00	=	0.00E+00	1.69E-10	/	2.00E-01	=	8.43E-10
Toluene	9.45E-11	x	0.00E+00	=	0.00E+00	2.65E-10	/	8.00E-02	=	3.31E-09
			Pathway total	=	1.15E-06			Pathway total	=	5.30E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.82E-06	x		=	NA	2.19E-05	/[	5.00E-03	x	1000	]=	4.38E-06
Antimony	2.86E-10	x		=	NA	8.00E-10	/[		x	1000	]=	NA
Arsenic	5.61E-09	x	4.30E-03	=	2.41E-11	1.57E-08	/[	1.50E-05	x	1000	]=	1.05E-06
Barium	1.01E-07	x		=	NA	2.83E-07	/[	5.00E-04	x	1000	]=	5.66E-07
Beryllium	2.22E-10	x	2.40E-03	=	5.33E-13	6.22E-10	/[	2.00E-05	x	1001	]=	3.11E-08
Cadmium	1.54E-10	x	1.80E-03	=	2.76E-13	4.30E-10	/[	1.00E-05	x	1002	]=	4.29E-08
Chromium	1.88E-08	x	8.40E-02	=	1.58E-09	5.25E-08	/[	1.00E-04	x	1003	]=	5.24E-07
Cobalt	1.14E-08	x	9.00E-03	=	1.02E-10	3.18E-08	/[	6.00E-06	x	1004	]=	5.29E-06
Copper	1.36E-08	x		=	NA	3.81E-08	/[		x	1005	]=	NA
Fluoride	1.85E-09	x		=	NA	5.18E-09	/[	1.30E-02	x	1000	]=	3.99E-10
Iron	2.91E-05	x		=	NA	8.16E-05	/[		x	1000	]=	NA
Lithium	8.45E-09	x		=	NA	2.37E-08	/[		x	1000	]=	NA
Manganese	4.56E-07	x		=	NA	1.28E-06	/[	5.00E-05	x	1000	]=	2.55E-05
Molybdenum	2.23E-09	x	0.00E+00	=	0.00E+00	6.26E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	1.46E-08	x	2.60E-04	=	3.80E-12	4.09E-08	/[	9.00E-05	x	1000	]=	4.55E-07
Nitrate	3.62E-08	x		=	NA	1.01E-07	/[		x	1000	]=	NA
Nitrite	1.45E-09	x		=	NA	4.06E-09	/[		x	1000	]=	NA
Selenium	1.10E-09	x	0.00E+00	=	0.00E+00	3.07E-09	/[	2.00E-02	x	1000	]=	1.54E-10
Silver	7.31E-11	x		=	NA	2.05E-10	/[		x	1000	]=	NA
Strontium	3.73E-08	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Total Uranium	6.09E-10	x		=	NA	1.71E-09	/[	4.00E-05	x	1000	]=	4.26E-08
Vanadium	7.39E-08	x		=	NA	2.07E-07	/[	1.00E-04	x	1000	]=	2.07E-06
Zinc	5.00E-08	x		=	NA	1.40E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.23E-10	x	0.00E+00	=	0.00E+00	6.26E-10	/[		x	1000	]=	NA
Di-n-butylphthalate	6.37E-10	x	0.00E+00	=	0.00E+00	1.78E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.40E-13	x	0.00E+00	=	0.00E+00	1.23E-12	/[	1.00E+00	x	1000	]=	1.23E-15
Toluene	6.90E-13	x	0.00E+00	=	0.00E+00	1.93E-12	/	5.00E+00	x	1000	]=	3.87E-16
			Pathway total =		1.71E-09					Pathway total =		4.00E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.92E-07	x	1.50E+00	=	2.88E-07	5.37E-07	/	3.00E-04	=	1.79E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.75E-10	x		=	NA	4.90E-10	/	2.50E-05	=	1.96E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	2.55E-08	x	1.90E-03	=	4.84E-11	7.13E-08	/	2.00E-01	=	3.57E-07
Di-n-butylphthalate	7.26E-08	x		=	NA	2.03E-07	/	1.00E-01	=	2.03E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		2.88E-07			Pathway total =		1.81E-03

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04
Arsenic	Sum of all pathways	=	1.44E-06	Sum of all pathways	=	9.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Beryllium	Sum of all pathways	=	5.33E-13	Sum of all pathways	=	4.3E-05
Cadmium	Sum of all pathways	=	2.76E-13	Sum of all pathways	=	7.8E-05
Chromium	Sum of all pathways	=	1.58E-09	Sum of all pathways	=	2.4E-03
Cobalt	Sum of all pathways	=	1.02E-10	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Nickel	Sum of all pathways	=	3.80E-12	Sum of all pathways	=	2.8E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.6E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-05
Butylbenzylphthalate	Sum of all pathways	=	1.06E-10	Sum of all pathways	=	7.8E-07
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-06
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-09

Total Carcinogenic Risk		
All Pathways and Chemicals	=	1E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.49E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.18E-03	=	[	7.74E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	3.30E-07	=	[	2.16E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.21E-06	=	[	7.89E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	3.73E-05	=	[	2.44E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	5.01E-08	=	[	3.28E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Boron	6.71E-06	=	[	4.39E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.73E-08	=	[	1.13E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.77E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.26E-06	=	[	8.27E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	2.11E-06	=	[	1.38E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	2.34E-07	=	[	1.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.68E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.33E-06	=	[	8.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.86E-05	=	[	3.83E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	2.48E-09	=	[	1.62E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	2.09E-06	=	[	1.37E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.41E-06	=	[	9.23E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	3.82E-07	=	[	2.50E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	9.54E-09	=	[	6.24E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	1.91E-05	=	[	1.25E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Tin	5.50E-07	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	9.94E-08	=	[	6.50E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	8.30E-06	=	[	5.43E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	8.00E-06	=	[	5.23E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.16E-07	=	[	2.07E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.19E-08	=	[	7.78E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.31E-03	=	[	7.74E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	9.25E-07	=	[	2.16E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	3.38E-06	=	[	7.89E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	1.04E-04	=	[	2.44E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	1.40E-07	=	[	3.28E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Boron	1.88E-05	=	[	4.39E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.84E-08	=	[	1.13E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	4.97E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.54E-06	=	[	8.27E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.91E-06	=	[	1.38E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	6.55E-07	=	[	1.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.03E-02	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.72E-06	=	[	8.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.64E-04	=	[	3.83E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	6.93E-09	=	[	1.62E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	5.86E-06	=	[	1.37E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	3.95E-06	=	[	9.23E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	1.07E-06	=	[	2.50E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	2.67E-08	=	[	6.24E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	5.35E-05	=	[	1.25E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Tin	1.54E-06	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.78E-07	=	[	6.50E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.32E-05	=	[	5.43E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	2.24E-05	=	[	5.23E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	8.86E-07	=	[	2.07E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	3.33E-08	=	[	7.78E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.65E-06	=	[	1.1E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.41E-09	=	[	3.0E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	8.81E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	2.73E-07	=	[	3.3E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	3.66E-10	=	[	4.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	4.90E-08	=	[	6.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.26E-10	=	[	1.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.30E-08	=	[	1.6E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	9.24E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.54E-08	=	[	1.9E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.71E-09	=	[	2.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.69E-05	=	[	3.3E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	9.70E-09	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.28E-07	=	[	5.2E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.81E-11	=	[	2.2E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.53E-08	=	[	1.9E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.03E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	2.79E-09	=	[	3.4E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	6.97E-11	=	[	8.5E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	1.40E-07	=	[	1.7E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	4.02E-09	=	[	4.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	7.27E-10	=	[	8.9E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	6.07E-08	=	[	7.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.84E-08	=	[	7.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.31E-09	=	[	2.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	8.69E-11	=	[	1.1E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	2.42E-05	=	[1.1E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	6.76E-09	=	[3.0E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	2.47E-08	=	[1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	7.63E-07	=	[3.3E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	1.03E-09	=	[4.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	1.37E-07	=	[6.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	3.53E-10	=	[1.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	3.63E-08	=	[1.6E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.59E-08	=	[1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	4.32E-08	=	[1.9E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	4.79E-09	=	[2.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.54E-05	=	[3.3E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.71E-08	=	[1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.20E-06	=	[5.2E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	5.07E-11	=	[2.2E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	4.28E-08	=	[1.9E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.89E-08	=	[1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	7.82E-09	=	[3.4E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.95E-10	=	[8.5E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	3.91E-07	=	[1.7E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	1.13E-08	=	[4.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.03E-09	=	[8.9E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.70E-07	=	[7.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.64E-07	=	[7.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	6.47E-09	=	[2.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	2.43E-10	=	[1.1E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	3.01E-07	=	[	7.89E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.44E-10	=	[	1.13E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.64E-07	=	[	2.07E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	9.91E-09	=	[	7.78E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	8.44E-07	=	[	7.89E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.03E-10	=	[	1.13E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	7.38E-07	=	[	2.07E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.77E-08	=	[	7.78E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.18E-03	x	0.00E+00	=	0.00E+00	3.31E-03	/	1.00E+00	=	3.31E-03
Antimony	3.30E-07	x	0.00E+00	=	0.00E+00	9.25E-07	/	4.00E-04	=	2.31E-03
Arsenic	1.21E-06	x	1.50E+00	=	1.81E-06	3.38E-06	/	3.00E-04	=	1.13E-02
Barium	3.73E-05	x	0.00E+00	=	0.00E+00	1.04E-04	/	2.00E-01	=	5.22E-04
Beryllium	5.01E-08	x	0.00E+00	=	0.00E+00	1.40E-07	/	2.00E-03	=	7.02E-05
Boron	6.71E-06	x	0.00E+00	=	0.00E+00	1.88E-05	/	2.00E-01	=	9.40E-05
Cadmium	1.73E-08	x	0.00E+00	=	0.00E+00	4.84E-08	/	1.00E-03	=	4.84E-05
Chromium	1.77E-06	x	0.00E+00	=	0.00E+00	4.97E-06	/	3.00E-03	=	1.66E-03
Cobalt	1.26E-06	x	0.00E+00	=	0.00E+00	3.54E-06	/	3.00E-04	=	1.18E-02
Copper	2.11E-06	x	0.00E+00	=	0.00E+00	5.91E-06	/	4.00E-02	=	1.48E-04
Fluoride	2.34E-07	x	0.00E+00	=	0.00E+00	6.55E-07	/	4.00E-02	=	1.64E-05
Iron	3.68E-03	x	0.00E+00	=	0.00E+00	1.03E-02	/	7.00E-01	=	1.47E-02
Lithium	1.33E-06	x	0.00E+00	=	0.00E+00	3.72E-06	/	2.00E-03	=	1.86E-03
Manganese	5.86E-05	x	0.00E+00	=	0.00E+00	1.64E-04	/	1.40E-01	=	1.17E-03
Mercury	2.48E-09	x	0.00E+00	=	0.00E+00	6.93E-09	/	0.00E+00	=	NA
Nickel	2.09E-06	x	0.00E+00	=	0.00E+00	5.86E-06	/	2.00E-02	=	2.93E-04
Nitrate	1.41E-06	x	0.00E+00	=	0.00E+00	3.95E-06	/	7.10E+00	=	5.57E-07
Nitrite	3.82E-07	x	0.00E+00	=	0.00E+00	1.07E-06	/	3.00E-01	=	3.57E-06
Silver	9.54E-09	x	0.00E+00	=	0.00E+00	2.67E-08	/	5.00E-03	=	5.34E-06
Strontium	1.91E-05	x	0.00E+00	=	0.00E+00	5.35E-05	/	6.00E-01	=	8.92E-05
Tin	5.50E-07	x	0.00E+00	=	0.00E+00	1.54E-06	/	6.00E-01	=	2.57E-06
Total Uranium	9.94E-08	x	0.00E+00	=	0.00E+00	2.78E-07	/	3.00E-03	=	9.28E-05
Vanadium	8.30E-06	x	0.00E+00	=	0.00E+00	2.32E-05	/	5.00E-03	=	4.65E-03
Zinc	8.00E-06	x	0.00E+00	=	0.00E+00	2.24E-05	/	3.00E-01	=	7.46E-05
Bis(2-ethylhexyl) phthalate	3.16E-07	x	1.40E-02	=	4.43E-09	8.86E-07	/	2.00E-02	=	4.43E-05
Butylbenzylphthalate	1.19E-08	x	1.90E-03	=	2.26E-11	3.33E-08	/	2.00E-01	=	1.67E-07
			Pathway total	=	1.81E-06			Pathway total	=	5.43E-02

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.65E-06	x		=	NA	2.42E-05	/[	5.00E-03	x	1000	]=	4.84E-06
Antimony	2.41E-09	x		=	NA	6.76E-09	/[		x	1000	]=	NA
Arsenic	8.81E-09	x	4.30E-03	=	3.79E-11	2.47E-08	/[	1.50E-05	x	1000	]=	1.65E-06
Barium	2.73E-07	x		=	NA	7.63E-07	/[	5.00E-04	x	1000	]=	1.53E-06
Beryllium	3.66E-10	x	2.40E-03	=	8.79E-13	1.03E-09	/[	2.00E-05	x	1000	]=	5.13E-08
Boron	4.90E-08	x	0.00E+00	=	0.00E+00	1.37E-07	/[	2.00E-02	x	1000	]=	6.86E-09
Cadmium	1.26E-10	x	1.80E-03	=	2.27E-13	3.53E-10	/[	1.00E-05	x	1000	]=	3.53E-08
Chromium	1.30E-08	x	8.40E-02	=	1.09E-09	3.63E-08	/[	1.00E-04	x	1000	]=	3.63E-07
Cobalt	9.24E-09	x	9.00E-03	=	8.31E-11	2.59E-08	/[	6.00E-06	x	1000	]=	4.31E-06
Copper	1.54E-08	x		=	NA	4.32E-08	/[		x	1000	]=	NA
Fluoride	1.71E-09	x		=	NA	4.79E-09	/[	1.30E-02	x	1000	]=	3.68E-10
Iron	2.69E-05	x		=	NA	7.54E-05	/[		x	1000	]=	NA
Lithium	9.70E-09	x		=	NA	2.71E-08	/[		x	1000	]=	NA
Manganese	4.28E-07	x		=	NA	1.20E-06	/[	5.00E-05	x	1000	]=	2.40E-05
Mercury	1.81E-11	x	0.00E+00	=	0.00E+00	5.07E-11	/[	3.00E-04	x	1000	]=	1.69E-10
Nickel	1.53E-08	x	2.60E-04	=	3.98E-12	4.28E-08	/[	9.00E-05	x	1000	]=	4.76E-07
Nitrate	1.03E-08	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Nitrite	2.79E-09	x		=	NA	7.82E-09	/[		x	1000	]=	NA
Silver	6.97E-11	x		=	NA	1.95E-10	/[		x	1000	]=	NA
Strontium	1.40E-07	x		=	NA	3.91E-07	/[		x	1000	]=	NA
Tin	4.02E-09	x		=	NA	1.13E-08	/[		x	1000	]=	NA
Total Uranium	7.27E-10	x		=	NA	2.03E-09	/[	4.00E-05	x	1000	]=	5.09E-08
Vanadium	6.07E-08	x		=	NA	1.70E-07	/[	1.00E-04	x	1000	]=	1.70E-06
Zinc	5.84E-08	x		=	NA	1.64E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.31E-09	x	2.40E-06	=	5.55E-15	6.47E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	8.69E-11	x	0.00E+00	=	0.00E+00	2.43E-10	/		x	1000	]=	NA
			Pathway total =		1.21E-09					Pathway total =		3.90E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.01E-07	x	1.50E+00	=	4.52E-07	8.44E-07	/	3.00E-04	=	2.81E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.44E-10	x		=	NA	4.03E-10	/	2.50E-05	=	1.61E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	2.64E-07	x	1.40E-02	=	3.69E-09	7.38E-07	/	2.00E-02	=	3.69E-05
Butylbenzylphthalate	9.91E-09	x	1.90E-03	=	1.88E-11	2.77E-08	/	2.00E-01	=	1.39E-07
			Pathway total =		**4.56E-07**			Pathway total =		2.87E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Arsenic	Sum of all pathways	=	2.26E-06	Sum of all pathways	=	1.4E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-04
Beryllium	Sum of all pathways	=	8.79E-13	Sum of all pathways	=	7.0E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-05
Cadmium	Sum of all pathways	=	2.27E-13	Sum of all pathways	=	6.5E-05
Chromium	Sum of all pathways	=	1.09E-09	Sum of all pathways	=	1.7E-03
Cobalt	Sum of all pathways	=	8.31E-11	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-10
Nickel	Sum of all pathways	=	3.98E-12	Sum of all pathways	=	2.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.6E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	8.9E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	8.12E-09	Sum of all pathways	=	8.1E-05
Butylbenzylphthalate	Sum of all pathways	=	4.14E-11	Sum of all pathways	=	3.1E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	2E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.72E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	9.78E-04	=	[	6.40E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	4.12E-08	=	[	2.69E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	5.50E-07	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.28E-05	=	[	8.34E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	2.51E-08	=	[	1.64E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.46E-08	=	[	9.56E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.48E-06	=	[	9.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.26E-06	=	[	8.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	1.86E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	1.93E-07	=	[	1.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.22E-03	=	[	2.11E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.08E-06	=	[	7.07E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.44E-05	=	[	3.56E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	2.61E-09	=	[	1.71E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	3.75E-07	=	[	2.45E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	2.01E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.17E-06	=	[	7.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	4.74E-07	=	[	3.10E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	2.06E-07	=	[	1.35E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.44E-08	=	[	9.40E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	4.74E-06	=	[	3.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	1.05E-07	=	[	6.88E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	9.04E-06	=	[	5.91E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	5.81E-06	=	[	3.80E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	7.06E-09	=	[	4.62E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
1-Butanol	3.39E-09	=	[	2.22E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.81E-07	=	[	1.84E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	9.05E-09	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Hexane	9.25E-09	=	[	6.05E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	3.46E-09	=	[	2.27E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.74E-03	=	[	6.40E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.15E-07	=	[	2.69E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	1.54E-06	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.57E-05	=	[	8.34E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	7.02E-08	=	[	1.64E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.09E-08	=	[	9.56E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	4.14E-06	=	[	9.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.54E-06	=	[	8.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.21E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	5.41E-07	=	[	1.26E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	9.02E-03	=	[	2.11E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.03E-06	=	[	7.07E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.52E-04	=	[	3.56E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	7.32E-09	=	[	1.71E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	1.05E-06	=	[	2.45E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	5.62E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	3.29E-06	=	[	7.68E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	1.33E-06	=	[	3.10E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	5.78E-07	=	[	1.35E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	4.02E-08	=	[	9.40E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.33E-05	=	[	3.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.94E-07	=	[	6.88E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.53E-05	=	[	5.91E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.63E-05	=	[	3.80E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	1.98E-08	=	[	4.62E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
1-Butanol	9.50E-09	=	[	2.22E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	7.88E-07	=	[	1.84E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.53E-08	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Hexane	2.59E-08	=	[	6.05E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	9.70E-09	=	[	2.27E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.15E-06	=	[	8.8E-05	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	3.01E-10	=	[	3.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	4.02E-09	=	[	4.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	9.32E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.83E-10	=	[	2.2E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.07E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.08E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	9.23E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.36E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.41E-09	=	[	1.7E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.35E-05	=	[	2.9E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	7.90E-09	=	[	9.7E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	3.98E-07	=	[	4.9E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.91E-11	=	[	2.3E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	2.74E-09	=	[	3.4E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.47E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	8.58E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	3.46E-09	=	[	4.2E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	1.51E-09	=	[	1.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	1.05E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	3.46E-08	=	[	4.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	7.68E-10	=	[	9.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	6.60E-08	=	[	8.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	4.25E-08	=	[	5.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	5.16E-11	=	[	6.3E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
1-Butanol	2.48E-11	=	[	3.0E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.06E-09	=	[	2.5E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.61E-11	=	[	8.1E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Hexane	6.76E-11	=	[	8.3E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	2.53E-11	=	[	3.1E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	2.00E-05	=	[	8.8E-05	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	8.42E-10	=	[	3.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.13E-08	=	[	4.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.61E-07	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	5.13E-10	=	[	2.2E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	2.99E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	3.03E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.58E-08	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	3.81E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	3.95E-09	=	[	1.7E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	6.59E-05	=	[	2.9E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.21E-08	=	[	9.7E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.11E-06	=	[	4.9E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	5.35E-11	=	[	2.3E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	7.66E-09	=	[	3.4E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	4.11E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.40E-08	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	9.69E-09	=	[	4.2E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	4.22E-09	=	[	1.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.94E-10	=	[	1.3E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	9.70E-08	=	[	4.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.15E-09	=	[	9.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.85E-07	=	[	8.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.19E-07	=	[	5.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.44E-10	=	[	6.3E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
1-Butanol	6.94E-11	=	[	3.0E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Hexane	1.89E-10	=	[	8.3E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	7.08E-11	=	[	3.1E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.37E-07	=	[	3.60E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.22E-10	=	[	9.56E-02	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
1-Butanol	2.83E-09	=	[	2.22E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.34E-07	=	[	1.84E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	7.54E-09	=	[	5.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	2.88E-09	=	[	2.27E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	3.85E-07	=	[	3.60E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	3.41E-10	=	[	9.56E-02	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
1-Butanol	7.91E-09	=	[	2.22E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	6.56E-07	=	[	1.84E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	2.11E-08	=	[	5.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	8.07E-09	=	[	2.27E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration

SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	9.78E-04	x	0.00E+00	=	0.00E+00	2.74E-03	/	1.00E+00	=	2.74E-03
Antimony	4.12E-08	x	0.00E+00	=	0.00E+00	1.15E-07	/	4.00E-04	=	2.88E-04
Arsenic	5.50E-07	x	1.50E+00	=	8.25E-07	1.54E-06	/	3.00E-04	=	5.14E-03
Barium	1.28E-05	x	0.00E+00	=	0.00E+00	3.57E-05	/	2.00E-01	=	1.79E-04
Beryllium	2.51E-08	x	0.00E+00	=	0.00E+00	7.02E-08	/	2.00E-03	=	3.51E-05
Cadmium	1.46E-08	x	0.00E+00	=	0.00E+00	4.09E-08	/	1.00E-03	=	4.09E-05
Chromium	1.48E-06	x	0.00E+00	=	0.00E+00	4.14E-06	/	3.00E-03	=	1.38E-03
Cobalt	1.26E-06	x	0.00E+00	=	0.00E+00	3.54E-06	/	3.00E-04	=	1.18E-02
Copper	1.86E-06	x	0.00E+00	=	0.00E+00	5.21E-06	/	4.00E-02	=	1.30E-04
Fluoride	1.93E-07	x	0.00E+00	=	0.00E+00	5.41E-07	/	4.00E-02	=	1.35E-05
Iron	3.22E-03	x	0.00E+00	=	0.00E+00	9.02E-03	/	7.00E-01	=	1.29E-02
Lithium	1.08E-06	x	0.00E+00	=	0.00E+00	3.03E-06	/	2.00E-03	=	1.51E-03
Manganese	5.44E-05	x	0.00E+00	=	0.00E+00	1.52E-04	/	1.40E-01	=	1.09E-03
Mercury	2.61E-09	x	0.00E+00	=	0.00E+00	7.32E-09	/	0.00E+00	=	NA
Molybdenum	3.75E-07	x	0.00E+00	=	0.00E+00	1.05E-06	/	5.00E-03	=	2.10E-04
Nickel	2.01E-06	x	0.00E+00	=	0.00E+00	5.62E-06	/	2.00E-02	=	2.81E-04
Nitrate	1.17E-06	x	0.00E+00	=	0.00E+00	3.29E-06	/	7.10E+00	=	4.63E-07
Nitrite	4.74E-07	x	0.00E+00	=	0.00E+00	1.33E-06	/	3.00E-01	=	4.42E-06
Selenium	2.06E-07	x	0.00E+00	=	0.00E+00	5.78E-07	/	5.00E-03	=	1.16E-04
Silver	1.44E-08	x	0.00E+00	=	0.00E+00	4.02E-08	/	5.00E-03	=	8.05E-06
Strontium	4.74E-06	x	0.00E+00	=	0.00E+00	1.33E-05	/	6.00E-01	=	2.21E-05
Total Uranium	1.05E-07	x	0.00E+00	=	0.00E+00	2.94E-07	/	3.00E-03	=	9.81E-05
Vanadium	9.04E-06	x	0.00E+00	=	0.00E+00	2.53E-05	/	5.00E-03	=	5.06E-03
Zinc	5.81E-06	x	0.00E+00	=	0.00E+00	1.63E-05	/	3.00E-01	=	5.42E-05
Acetone	7.06E-09	x	0.00E+00	=	0.00E+00	1.98E-08	/	9.00E-01	=	2.20E-08
1-Butanol	3.39E-09	x	0.00E+00	=	0.00E+00	9.50E-09	/	1.00E-01	=	9.50E-08
Bis(2-ethylhexyl) phthalate	2.81E-07	x	1.40E-02	=	3.94E-09	7.88E-07	/	2.00E-02	=	3.94E-05
Butylbenzylphthalate	9.05E-09	x	1.90E-03	=	1.72E-11	2.53E-08	/	2.00E-01	=	1.27E-07
Hexane	9.25E-09	x	0.00E+00	=	0.00E+00	2.59E-08	/	6.00E-02	=	4.32E-07
beta-BHC	3.46E-09	x	1.80E+00	=	6.23E-09	9.70E-09	/	0.00E+00	=	NA
			Pathway total	=	8.36E-07			Pathway total	=	4.31E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.15E-06	x		=	NA	2.00E-05	/[	5.00E-03	x	1000	]=	4.00E-06
Antimony	3.01E-10	x		=	NA	8.42E-10	/[		x	1000	]=	NA
Arsenic	4.02E-09	x	4.30E-03	=	1.73E-11	1.13E-08	/[	1.50E-05	x	1000	]=	7.50E-07
Barium	9.32E-08	x		=	NA	2.61E-07	/[	5.00E-04	x	1000	]=	5.22E-07
Beryllium	1.83E-10	x	2.40E-03	=	4.39E-13	5.13E-10	/[	2.00E-05	x	1000	]=	2.56E-08
Cadmium	1.07E-10	x	1.80E-03	=	1.92E-13	2.99E-10	/[	1.00E-05	x	1000	]=	2.99E-08
Chromium	1.08E-08	x	8.40E-02	=	9.08E-10	3.03E-08	/[	1.00E-04	x	1000	]=	3.03E-07
Cobalt	9.23E-09	x	9.00E-03	=	8.30E-11	2.58E-08	/[	6.00E-06	x	1000	]=	4.31E-06
Copper	1.36E-08	x		=	NA	3.81E-08	/[		x	1000	]=	NA
Fluoride	1.41E-09	x		=	NA	3.95E-09	/[	1.30E-02	x	1000	]=	3.04E-10
Iron	2.35E-05	x		=	NA	6.59E-05	/[		x	1000	]=	NA
Lithium	7.90E-09	x		=	NA	2.21E-08	/[		x	1000	]=	NA
Manganese	3.98E-07	x		=	NA	1.11E-06	/[	5.00E-05	x	1000	]=	2.23E-05
Mercury	1.91E-11	x	0.00E+00	=	0.00E+00	5.35E-11	/[	3.00E-04	x	1000	]=	1.78E-10
Molybdenum	2.74E-09	x	0.00E+00	=	0.00E+00	7.66E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	1.47E-08	x	2.60E-04	=	3.81E-12	4.11E-08	/[	9.00E-05	x	1000	]=	4.56E-07
Nitrate	8.58E-09	x		=	NA	2.40E-08	/[		x	1000	]=	NA
Nitrite	3.46E-09	x		=	NA	9.69E-09	/[		x	1000	]=	NA
Selenium	1.51E-09	x	0.00E+00	=	0.00E+00	4.22E-09	/[	2.00E-02	x	1000	]=	2.11E-10
Silver	1.05E-10	x		=	NA	2.94E-10	/[		x	1000	]=	NA
Strontium	3.46E-08	x		=	NA	9.70E-08	/[		x	1000	]=	NA
Total Uranium	7.68E-10	x		=	NA	2.15E-09	/[	4.00E-05	x	1000	]=	5.38E-08
Vanadium	6.60E-08	x		=	NA	1.85E-07	/[	1.00E-04	x	1000	]=	1.85E-06
Zinc	4.25E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Acetone	5.16E-11	x	0.00E+00	=	0.00E+00	1.44E-10	/[	3.10E+01	x	1000	]=	4.66E-15
1-Butanol	2.48E-11	x	0.00E+00	=	0.00E+00	6.94E-11	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.06E-09	x	2.40E-06	=	4.93E-15	1.89E-10	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.61E-11	x	0.00E+00	=	0.00E+00	7.08E-11	/[		x	1000	]=	NA
Hexane	6.76E-11	x	0.00E+00	=	0.00E+00	0.00E+00	/[	7.00E-01	x	1000	]=	0.00E+00
beta-BHC	2.53E-11	x	5.30E-04	=	1.34E-14	0.00E+00	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.01E-09					Pathway total =		3.46E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.37E-07	x	1.50E+00	=	2.06E-07	3.85E-07	/	3.00E-04	=	1.28E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.22E-10	x		=	NA	3.41E-10	/	2.50E-05	=	1.36E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	2.83E-09	x		=	NA	7.91E-09	/	1.00E-01	=	7.91E-08
Bis(2-ethylhexyl) phthalate	2.34E-07	x	1.40E-02	=	3.28E-09	6.56E-07	/	2.00E-02	=	3.28E-05
Butylbenzylphthalate	7.54E-09	x	1.90E-03	=	1.43E-11	2.11E-08	/	2.00E-01	=	1.06E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	2.88E-09	x	1.80E+00	=	5.19E-09	8.07E-09	/		=	NA
			Pathway total =		2.15E-07			Pathway total =		1.33E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-04
Arsenic	Sum of all pathways	=	1.03E-06	Sum of all pathways	=	6.4E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Beryllium	Sum of all pathways	=	4.39E-13	Sum of all pathways	=	3.5E-05
Cadmium	Sum of all pathways	=	1.92E-13	Sum of all pathways	=	5.5E-05
Chromium	Sum of all pathways	=	9.08E-10	Sum of all pathways	=	1.4E-03
Cobalt	Sum of all pathways	=	8.30E-11	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-10
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Nickel	Sum of all pathways	=	3.81E-12	Sum of all pathways	=	2.8E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.8E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-08
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.22E-09	Sum of all pathways	=	7.2E-05
Butylbenzylphthalate	Sum of all pathways	=	3.15E-11	Sum of all pathways	=	2.3E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-07
beta-BHC	Sum of all pathways	=	1.14E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1E-06	All Pathways and Chemicals	=	4.45E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.09E-03	=	[	7.13E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	3.60E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	7.74E-07	=	[	5.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.25E-05	=	[	8.15E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	4.22E-08	=	[	2.76E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.85E-08	=	[	1.21E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.90E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.40E-06	=	[	9.16E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	1.95E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	4.39E-07	=	[	2.87E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.87E-03	=	[	2.53E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.28E-06	=	[	8.37E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.57E-05	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	2.94E-09	=	[	1.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.70E-06	=	[	1.11E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.75E-06	=	[	1.14E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	7.04E-07	=	[	4.61E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	2.71E-08	=	[	1.77E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.07E-06	=	[	3.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Tin	2.20E-06	=	[	1.44E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	2.40E-07	=	[	1.57E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	1.19E-05	=	[	7.78E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	2.80E-05	=	[	1.83E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	1.50E-09	=	[	9.80E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.52E-07	=	[	2.30E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Di-n-butylphthalate	1.32E-07	=	[	8.63E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	2.05E-10	=	[	1.34E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	4.49E-11	=	[	2.94E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	3.94E-09	=	[	2.58E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1260	4.68E-09	=	[	2.68E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.05E-03	=	[	7.13E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.01E-07	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	2.17E-06	=	[	5.06E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.49E-05	=	[	8.15E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	1.18E-07	=	[	2.76E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	5.17E-08	=	[	1.21E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	5.31E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.92E-06	=	[	9.16E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.47E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	1.23E-06	=	[	2.87E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.08E-02	=	[	2.53E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.58E-06	=	[	8.37E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.56E-04	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	8.22E-09	=	[	1.92E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	4.76E-06	=	[	1.11E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	4.90E-06	=	[	1.14E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	1.97E-06	=	[	4.61E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	7.59E-08	=	[	1.77E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.42E-05	=	[	3.31E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Tin	6.16E-06	=	[	1.44E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	6.71E-07	=	[	1.57E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	3.33E-05	=	[	7.78E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	7.85E-05	=	[	1.83E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	4.20E-09	=	[	9.80E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	9.85E-07	=	[	2.30E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Di-n-butylphthalate	3.69E-07	=	[	8.63E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	5.74E-10	=	[	1.34E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	1.26E-10	=	[	2.94E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	1.10E-08	=	[	2.58E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1260	1.15E-08	=	[	2.68E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.96E-06	=	[	9.8E-05	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.63E-10	=	[	3.2E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	5.66E-09	=	[	6.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	9.10E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	3.08E-10	=	[	3.8E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.35E-10	=	[	1.7E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.39E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	1.02E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.43E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	3.21E-09	=	[	3.9E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.83E-05	=	[	3.5E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	9.34E-09	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.07E-07	=	[	5.0E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	2.14E-11	=	[	2.6E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.24E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.28E-08	=	[	1.6E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	5.15E-09	=	[	6.3E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	1.98E-10	=	[	2.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	3.70E-08	=	[	4.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	1.61E-08	=	[	2.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	1.75E-09	=	[	2.1E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	8.69E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.05E-07	=	[	2.5E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	1.10E-11	=	[	1.3E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.57E-09	=	[	3.2E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	9.64E-10	=	[	1.2E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	1.50E-12	=	[	1.8E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	3.28E-13	=	[	4.0E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	2.88E-11	=	[	3.5E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.99E-11	=	[	3.7E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	2.23E-05	=	[	9.8E-05	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	7.36E-10	=	[	3.2E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.58E-08	=	[	6.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.55E-07	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	8.64E-10	=	[	3.8E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	3.78E-10	=	[	1.7E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	3.88E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.86E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	3.99E-08	=	[	1.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	8.98E-09	=	[	3.9E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.91E-05	=	[	3.5E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.62E-08	=	[	1.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.14E-06	=	[	5.0E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	6.00E-11	=	[	2.6E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.47E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	3.58E-08	=	[	1.6E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	1.44E-08	=	[	6.3E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	5.55E-10	=	[	2.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.04E-07	=	[	4.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	4.50E-08	=	[	2.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	4.90E-09	=	[	2.1E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	2.43E-07	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	5.74E-07	=	[	2.5E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	3.07E-11	=	[	1.3E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	7.19E-09	=	[	3.2E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Di-n-butylphthalate	2.70E-09	=	[	1.2E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	4.19E-12	=	[	1.8E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	9.19E-13	=	[	4.0E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	8.07E-11	=	[	3.5E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1260	8.38E-11	=	[	3.7E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.93E-07	=	[	5.06E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	1.54E-10	=	[	1.21E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.93E-07	=	[	2.30E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Di-n-butylphthalate	1.10E-07	=	[	8.63E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
beta-BHC	3.28E-09	=	[	2.58E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Aroclor-1260	4.78E-09	=	[	2.68E-02	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	5.42E-07	=	[	5.06E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	4.31E-10	=	[	1.21E-01	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Bis(2-ethylhexyl) phthalate	8.20E-07	=	[	2.30E+00	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Di-n-butylphthalate	3.08E-07	=	[	8.63E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
beta-BHC	9.20E-09	=	[	2.58E-02	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Aroclor-1260	1.34E-08	=	[	2.68E-02	x	1.00E-06	x	3,470	x	0.12	x	0.14	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.09E-03	x	0.00E+00	=	0.00E+00	3.05E-03	/	1.00E+00	=	3.05E-03
Antimony	3.60E-08	x	0.00E+00	=	0.00E+00	1.01E-07	/	4.00E-04	=	2.52E-04
Arsenic	7.74E-07	x	1.50E+00	=	1.16E-06	2.17E-06	/	3.00E-04	=	7.23E-03
Barium	1.25E-05	x	0.00E+00	=	0.00E+00	3.49E-05	/	2.00E-01	=	1.74E-04
Beryllium	4.22E-08	x	0.00E+00	=	0.00E+00	1.18E-07	/	2.00E-03	=	5.91E-05
Cadmium	1.85E-08	x	0.00E+00	=	0.00E+00	5.17E-08	/	1.00E-03	=	5.17E-05
Chromium	1.90E-06	x	0.00E+00	=	0.00E+00	5.31E-06	/	3.00E-03	=	1.77E-03
Cobalt	1.40E-06	x	0.00E+00	=	0.00E+00	3.92E-06	/	3.00E-04	=	1.31E-02
Copper	1.95E-06	x	0.00E+00	=	0.00E+00	5.47E-06	/	4.00E-02	=	1.37E-04
Fluoride	4.39E-07	x	0.00E+00	=	0.00E+00	1.23E-06	/	4.00E-02	=	3.07E-05
Iron	3.87E-03	x	0.00E+00	=	0.00E+00	1.08E-02	/	7.00E-01	=	1.55E-02
Lithium	1.28E-06	x	0.00E+00	=	0.00E+00	3.58E-06	/	2.00E-03	=	1.79E-03
Manganese	5.57E-05	x	0.00E+00	=	0.00E+00	1.56E-04	/	1.40E-01	=	1.11E-03
Mercury	2.94E-09	x	0.00E+00	=	0.00E+00	8.22E-09	/	0.00E+00	=	NA
Nickel	1.70E-06	x	0.00E+00	=	0.00E+00	4.76E-06	/	2.00E-02	=	2.38E-04
Nitrate	1.75E-06	x	0.00E+00	=	0.00E+00	4.90E-06	/	7.10E+00	=	6.90E-07
Nitrite	7.04E-07	x	0.00E+00	=	0.00E+00	1.97E-06	/	3.00E-01	=	6.58E-06
Silver	2.71E-08	x	0.00E+00	=	0.00E+00	7.59E-08	/	5.00E-03	=	1.52E-05
Strontium	5.07E-06	x	0.00E+00	=	0.00E+00	1.42E-05	/	6.00E-01	=	2.36E-05
Tin	2.20E-06	x	0.00E+00	=	0.00E+00	6.16E-06	/	6.00E-01	=	1.03E-05
Total Uranium	2.40E-07	x	0.00E+00	=	0.00E+00	6.71E-07	/	3.00E-03	=	2.24E-04
Vanadium	1.19E-05	x	0.00E+00	=	0.00E+00	3.33E-05	/	5.00E-03	=	6.66E-03
Zinc	2.80E-05	x	0.00E+00	=	0.00E+00	7.85E-05	/	3.00E-01	=	2.62E-04
Acetone	1.50E-09	x	0.00E+00	=	0.00E+00	4.20E-09	/	9.00E-01	=	4.66E-09
Bis(2-ethylhexyl) phthalate	3.52E-07	x	1.40E-02	=	4.92E-09	9.85E-07	/	2.00E-02	=	4.92E-05
Di-n-butylphthalate	1.32E-07	x	0.00E+00	=	0.00E+00	3.69E-07	/	1.00E-01	=	3.69E-06
Methylene chloride	2.05E-10	x	2.00E-03	=	4.10E-13	5.74E-10	/	6.00E-03	=	9.56E-08
Toluene	4.49E-11	x	0.00E+00	=	0.00E+00	1.26E-10	/	8.00E-02	=	1.57E-09
beta-BHC	3.94E-09	x	1.80E+00	=	7.10E-09	1.10E-08	/	0.00E+00	=	NA
Aroclor-1260	4.68E-09	x	2.00E+00	=	9.37E-09	1.15E-08	/	0.00E+00	=	NA
			Pathway total	=	1.18E-06			Pathway total	=	5.17E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.96E-06	x		=	NA	2.23E-05	/[	5.00E-03	x	1000	]=	4.46E-06
Antimony	2.63E-10	x		=	NA	7.36E-10	/[		x	1000	]=	NA
Arsenic	5.66E-09	x	4.30E-03	=	2.43E-11	1.58E-08	/[	1.50E-05	x	1000	]=	1.06E-06
Barium	9.10E-08	x		=	NA	2.55E-07	/[	5.00E-04	x	1000	]=	5.10E-07
Beryllium	3.08E-10	x	2.40E-03	=	7.40E-13	8.64E-10	/[	2.00E-05	x	1000	]=	4.32E-08
Cadmium	1.35E-10	x	1.80E-03	=	2.43E-13	3.78E-10	/[	1.00E-05	x	1000	]=	3.78E-08
Chromium	1.39E-08	x	8.40E-02	=	1.16E-09	3.88E-08	/[	1.00E-04	x	1000	]=	3.88E-07
Cobalt	1.02E-08	x	9.00E-03	=	9.21E-11	2.86E-08	/[	6.00E-06	x	1000	]=	4.77E-06
Copper	1.43E-08	x		=	NA	3.99E-08	/[		x	1000	]=	NA
Fluoride	3.21E-09	x		=	NA	8.98E-09	/[	1.30E-02	x	1000	]=	6.91E-10
Iron	2.83E-05	x		=	NA	7.91E-05	/[		x	1000	]=	NA
Lithium	9.34E-09	x		=	NA	2.62E-08	/[		x	1000	]=	NA
Manganese	4.07E-07	x		=	NA	1.14E-06	/[	5.00E-05	x	1000	]=	2.28E-05
Mercury	2.14E-11	x	0.00E+00	=	0.00E+00	6.00E-11	/[	3.00E-04	x	1000	]=	2.00E-10
Nickel	1.24E-08	x	2.60E-04	=	3.23E-12	3.47E-08	/[	9.00E-05	x	1000	]=	3.86E-07
Nitrate	1.28E-08	x		=	NA	3.58E-08	/[		x	1000	]=	NA
Nitrite	5.15E-09	x		=	NA	1.44E-08	/[		x	1000	]=	NA
Silver	1.98E-10	x		=	NA	5.55E-10	/[		x	1000	]=	NA
Strontium	3.70E-08	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Tin	1.61E-08	x		=	NA	4.50E-08	/[		x	1000	]=	NA
Total Uranium	1.75E-09	x		=	NA	4.90E-09	/[	4.00E-05	x	1000	]=	1.23E-07
Vanadium	8.69E-08	x		=	NA	2.43E-07	/[	1.00E-04	x	1000	]=	2.43E-06
Zinc	2.05E-07	x		=	NA	5.74E-07	/[		x	1000	]=	NA
Acetone	1.10E-11	x	0.00E+00	=	0.00E+00	3.07E-11	/[	3.10E+01	x	1000	]=	9.89E-16
Bis(2-ethylhexyl) phthalate	2.57E-09	x	2.40E-06	=	6.17E-15	7.19E-09	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	9.64E-10	x	0.00E+00	=	0.00E+00	2.70E-09	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.50E-12	x	1.00E-08	=	1.50E-20	4.19E-12	/[	6.00E-01	x	1000	]=	6.99E-15
Toluene	3.28E-13	x	0.00E+00	=	0.00E+00	9.19E-13	/[	5.00E+00	x	1000	]=	1.84E-16
beta-BHC	2.88E-11	x	5.30E-04	=	1.53E-14	8.07E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.99E-11	x	5.70E-04	=	1.71E-14	8.38E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.28E-09					Pathway total =		3.70E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.93E-07	x	1.50E+00	=	2.90E-07	5.42E-07	/	3.00E-04	=	1.81E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.54E-10	x		=	NA	4.31E-10	/	2.50E-05	=	1.72E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	2.93E-07	x	1.40E-02	=	4.10E-09	8.20E-07	/	2.00E-02	=	4.10E-05
Di-n-butylphthalate	1.10E-07	x		=	NA	3.08E-07	/	1.00E-01	=	3.08E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	3.28E-09	x	1.80E+00	=	5.91E-09	9.20E-09	/		=	NA
Aroclor-1260	4.78E-09	x	2.00E+00	=	9.55E-09	1.34E-08	/		=	NA
			Pathway total =		**3.10E-07**			Pathway total =		1.87E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Arsenic	Sum of all pathways	=	1.45E-06	Sum of all pathways	=	9.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Beryllium	Sum of all pathways	=	7.40E-13	Sum of all pathways	=	5.9E-05
Cadmium	Sum of all pathways	=	2.43E-13	Sum of all pathways	=	6.9E-05
Chromium	Sum of all pathways	=	1.16E-09	Sum of all pathways	=	1.8E-03
Cobalt	Sum of all pathways	=	9.21E-11	Sum of all pathways	=	1.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-10
Nickel	Sum of all pathways	=	3.23E-12	Sum of all pathways	=	2.4E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	9.02E-09	Sum of all pathways	=	9.0E-05
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-06
Methylene chloride	Sum of all pathways	=	4.10E-13	Sum of all pathways	=	9.6E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-09
beta-BHC	Sum of all pathways	=	1.30E-08	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	1.89E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk		
All Pathways and Chemicals	=	1E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.36E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.28E-03	=	[	8.39E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	3.75E-08	=	[	2.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	8.91E-07	=	[	5.83E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.21E-05	=	[	7.92E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	2.68E-08	=	[	1.75E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	5.31E-07	=	[	3.47E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.71E-06	=	[	1.12E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.61E-06	=	[	1.05E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	2.26E-06	=	[	1.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	5.40E-07	=	[	3.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.96E-03	=	[	2.59E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.38E-06	=	[	9.05E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	6.25E-05	=	[	4.09E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	2.06E-09	=	[	1.35E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.68E-06	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	6.07E-06	=	[	3.97E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	8.12E-07	=	[	5.31E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	1.07E-07	=	[	7.01E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Silver	1.06E-08	=	[	6.94E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	5.70E-06	=	[	3.73E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	1.01E-07	=	[	6.60E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	9.82E-06	=	[	6.42E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	7.43E-06	=	[	4.86E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	9.78E-10	=	[	6.40E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.64E-08	=	[	1.07E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
2-Hexanone	4.23E-10	=	[	2.77E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	2.14E-10	=	[	1.40E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	9.05E-11	=	[	5.92E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	3.59E-03	=	[	8.39E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.05E-07	=	[	2.45E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	2.50E-06	=	[	5.83E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	3.39E-05	=	[	7.92E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	7.49E-08	=	[	1.75E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	1.49E-06	=	[	3.47E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	4.79E-06	=	[	1.12E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	4.49E-06	=	[	1.05E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	6.34E-06	=	[	1.48E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	1.51E-06	=	[	3.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	1.11E-02	=	[	2.59E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.87E-06	=	[	9.05E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.75E-04	=	[	4.09E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	5.78E-09	=	[	1.35E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	4.71E-06	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	1.70E-05	=	[	3.97E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	2.27E-06	=	[	5.31E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	3.00E-07	=	[	7.01E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Silver	2.97E-08	=	[	6.94E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	1.60E-05	=	[	3.73E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.82E-07	=	[	6.60E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.75E-05	=	[	6.42E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	2.08E-05	=	[	4.86E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	2.74E-09	=	[	6.40E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	4.58E-08	=	[	1.07E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
2-Hexanone	1.19E-09	=	[	2.77E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	5.99E-10	=	[	1.40E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	2.53E-10	=	[	5.92E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.37E-06	=	[	1.1E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	2.74E-10	=	[	3.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	6.51E-09	=	[	8.0E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	8.85E-08	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.95E-10	=	[	2.4E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	3.88E-09	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.25E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	1.17E-08	=	[	1.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.65E-08	=	[	2.0E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	3.94E-09	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.89E-05	=	[	3.5E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	1.01E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.57E-07	=	[	5.6E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.51E-11	=	[	1.8E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.23E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	4.43E-08	=	[	5.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	5.93E-09	=	[	7.3E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	7.83E-10	=	[	9.6E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	7.75E-11	=	[	9.5E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	4.17E-08	=	[	5.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	7.37E-10	=	[	9.0E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	7.17E-08	=	[	8.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.43E-08	=	[	6.7E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	7.15E-12	=	[	8.8E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.20E-10	=	[	1.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
2-Hexanone	3.09E-12	=	[	3.8E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	1.56E-12	=	[	1.9E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	6.61E-13	=	[	8.1E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	2.62E-05	=	[	1.1E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	7.66E-10	=	[	3.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.82E-08	=	[	8.0E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	2.48E-07	=	[	1.1E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	5.47E-10	=	[	2.4E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.09E-08	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	3.50E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	3.28E-08	=	[	1.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	4.63E-08	=	[	2.0E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	1.10E-08	=	[	4.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	8.10E-05	=	[	3.5E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.83E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.28E-06	=	[	5.6E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	4.22E-11	=	[	1.8E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.44E-08	=	[	1.5E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.24E-07	=	[	5.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	1.66E-08	=	[	7.3E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	2.19E-09	=	[	9.6E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	2.17E-10	=	[	9.5E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.17E-07	=	[	5.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.06E-09	=	[	9.0E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	2.01E-07	=	[	8.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.52E-07	=	[	6.7E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	2.00E-11	=	[	8.8E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	3.35E-10	=	[	1.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
2-Hexanone	8.66E-12	=	[	3.8E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	4.38E-12	=	[	1.9E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.85E-12	=	[	8.1E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	2.23E-07	=	[	5.83E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cadmium	4.42E-09	=	[	3.47E+00	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.36E-08	=	[	1.07E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	6.24E-07	=	[	5.83E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cadmium	1.24E-08	=	[	3.47E+00	x	1.00E-06	x	3,470	x	0.12	x	0.001	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Butylbenzylphthalate	3.81E-08	=	[	1.07E-01	x	1.00E-06	x	3,470	x	0.12	x	0.1	x	1	x	250	x	25	]	/	[	80	x	9,125	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.28E-03	x	0.00E+00	=	0.00E+00	3.59E-03	/	1.00E+00	=	3.59E-03
Antimony	3.75E-08	x	0.00E+00	=	0.00E+00	1.05E-07	/	4.00E-04	=	2.62E-04
Arsenic	8.91E-07	x	1.50E+00	=	1.34E-06	2.50E-06	/	3.00E-04	=	8.32E-03
Barium	1.21E-05	x	0.00E+00	=	0.00E+00	3.39E-05	/	2.00E-01	=	1.70E-04
Beryllium	2.68E-08	x	0.00E+00	=	0.00E+00	7.49E-08	/	2.00E-03	=	3.75E-05
Cadmium	5.31E-07	x	0.00E+00	=	0.00E+00	1.49E-06	/	1.00E-03	=	1.49E-03
Chromium	1.71E-06	x	0.00E+00	=	0.00E+00	4.79E-06	/	3.00E-03	=	1.60E-03
Cobalt	1.61E-06	x	0.00E+00	=	0.00E+00	4.49E-06	/	3.00E-04	=	1.50E-02
Copper	2.26E-06	x	0.00E+00	=	0.00E+00	6.34E-06	/	4.00E-02	=	1.58E-04
Fluoride	5.40E-07	x	0.00E+00	=	0.00E+00	1.51E-06	/	4.00E-02	=	3.78E-05
Iron	3.96E-03	x	0.00E+00	=	0.00E+00	1.11E-02	/	7.00E-01	=	1.58E-02
Lithium	1.38E-06	x	0.00E+00	=	0.00E+00	3.87E-06	/	2.00E-03	=	1.94E-03
Manganese	6.25E-05	x	0.00E+00	=	0.00E+00	1.75E-04	/	1.40E-01	=	1.25E-03
Mercury	2.06E-09	x	0.00E+00	=	0.00E+00	5.78E-09	/	0.00E+00	=	NA
Nickel	1.68E-06	x	0.00E+00	=	0.00E+00	4.71E-06	/	2.00E-02	=	2.35E-04
Nitrate	6.07E-06	x	0.00E+00	=	0.00E+00	1.70E-05	/	7.10E+00	=	2.39E-06
Nitrite	8.12E-07	x	0.00E+00	=	0.00E+00	2.27E-06	/	3.00E-01	=	7.58E-06
Selenium	1.07E-07	x	0.00E+00	=	0.00E+00	3.00E-07	/	5.00E-03	=	6.00E-05
Silver	1.06E-08	x	0.00E+00	=	0.00E+00	2.97E-08	/	5.00E-03	=	5.94E-06
Strontium	5.70E-06	x	0.00E+00	=	0.00E+00	1.60E-05	/	6.00E-01	=	2.66E-05
Total Uranium	1.01E-07	x	0.00E+00	=	0.00E+00	2.82E-07	/	3.00E-03	=	9.42E-05
Vanadium	9.82E-06	x	0.00E+00	=	0.00E+00	2.75E-05	/	5.00E-03	=	5.50E-03
Zinc	7.43E-06	x	0.00E+00	=	0.00E+00	2.08E-05	/	3.00E-01	=	6.93E-05
Acetone	9.78E-10	x	0.00E+00	=	0.00E+00	2.74E-09	/	9.00E-01	=	3.04E-09
Butylbenzylphthalate	1.64E-08	x	1.90E-03	=	3.11E-11	4.58E-08	/	2.00E-01	=	2.29E-07
2-Hexanone	4.23E-10	x	0.00E+00	=	0.00E+00	1.19E-09	/	5.00E-03	=	2.37E-07
Methylene chloride	2.14E-10	x	2.00E-03	=	4.28E-13	5.99E-10	/	6.00E-03	=	9.99E-08
Toluene	9.05E-11	x	0.00E+00	=	0.00E+00	2.53E-10	/	8.00E-02	=	3.17E-09
			Pathway total	=	1.34E-06			Pathway total	=	5.57E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.37E-06	x		=	NA	2.62E-05	/[	5.00E-03	x	1000	]=	5.25E-06
Antimony	2.74E-10	x		=	NA	7.66E-10	/[		x	1000	]=	NA
Arsenic	6.51E-09	x	4.30E-03	=	2.80E-11	1.82E-08	/[	1.50E-05	x	1000	]=	1.22E-06
Barium	8.85E-08	x		=	NA	2.48E-07	/[	5.00E-04	x	1000	]=	4.95E-07
Beryllium	1.95E-10	x	2.40E-03	=	4.69E-13	5.47E-10	/[	2.00E-05	x	1000	]=	2.74E-08
Cadmium	3.88E-09	x	1.80E-03	=	6.98E-12	1.09E-08	/[	1.00E-05	x	1000	]=	1.09E-06
Chromium	1.25E-08	x	8.40E-02	=	1.05E-09	3.50E-08	/[	1.00E-04	x	1000	]=	3.50E-07
Cobalt	1.17E-08	x	9.00E-03	=	1.06E-10	3.28E-08	/[	6.00E-06	x	1000	]=	5.47E-06
Copper	1.65E-08	x		=	NA	4.63E-08	/[		x	1000	]=	NA
Fluoride	3.94E-09	x		=	NA	1.10E-08	/[	1.30E-02	x	1000	]=	8.49E-10
Iron	2.89E-05	x		=	NA	8.10E-05	/[		x	1000	]=	NA
Lithium	1.01E-08	x		=	NA	2.83E-08	/[		x	1000	]=	NA
Manganese	4.57E-07	x		=	NA	1.28E-06	/[	5.00E-05	x	1000	]=	2.56E-05
Mercury	1.51E-11	x	0.00E+00	=	0.00E+00	4.22E-11	/[	3.00E-04	x	1000	]=	1.41E-10
Nickel	1.23E-08	x	2.60E-04	=	3.19E-12	3.44E-08	/[	9.00E-05	x	1000	]=	3.82E-07
Nitrate	4.43E-08	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Nitrite	5.93E-09	x		=	NA	1.66E-08	/[		x	1000	]=	NA
Selenium	7.83E-10	x	0.00E+00	=	0.00E+00	2.19E-09	/[	2.00E-02	x	1000	]=	1.10E-10
Silver	7.75E-11	x		=	NA	2.17E-10	/[		x	1000	]=	NA
Strontium	4.17E-08	x		=	NA	1.17E-07	/[		x	1000	]=	NA
Total Uranium	7.37E-10	x		=	NA	2.06E-09	/[	4.00E-05	x	1000	]=	5.16E-08
Vanadium	7.17E-08	x		=	NA	2.01E-07	/[	1.00E-04	x	1000	]=	2.01E-06
Zinc	5.43E-08	x		=	NA	1.52E-07	/[		x	1000	]=	NA
Acetone	7.15E-12	x	0.00E+00	=	0.00E+00	2.00E-11	/[	3.10E+01	x	1000	]=	6.46E-16
Butylbenzylphthalate	1.20E-10	x	0.00E+00	=	0.00E+00	3.35E-10	/[		x	1000	]=	NA
2-Hexanone	3.09E-12	x	0.00E+00	=	0.00E+00	8.66E-12	/[	3.00E-02	x	1000	]=	2.89E-13
Methylene chloride	1.56E-12	x	1.00E-08	=	1.56E-20	4.38E-12	/[	6.00E-01	x	1000	]=	7.30E-15
Toluene	6.61E-13	x	0.00E+00	=	0.00E+00	1.85E-12	/[	5.00E+00	x	1000	]=	3.70E-16
			Pathway total =		1.20E-09					Pathway total =		4.19E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.23E-07	x	1.50E+00	=	3.34E-07	6.24E-07	/	3.00E-04	=	2.08E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.42E-09	x		=	NA	1.24E-08	/	2.50E-05	=	4.95E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.36E-08	x	1.90E-03	=	2.59E-11	3.81E-08	/	2.00E-01	=	1.91E-07
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		**3.34E-07**			Pathway total =		2.57E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Arsenic	Sum of all pathways	=	1.67E-06	Sum of all pathways	=	1.0E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Beryllium	Sum of all pathways	=	4.69E-13	Sum of all pathways	=	3.7E-05
Cadmium	Sum of all pathways	=	6.98E-12	Sum of all pathways	=	2.0E-03
Chromium	Sum of all pathways	=	1.05E-09	Sum of all pathways	=	1.6E-03
Cobalt	Sum of all pathways	=	1.06E-10	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-10
Nickel	Sum of all pathways	=	3.19E-12	Sum of all pathways	=	2.4E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-09
Butylbenzylphthalate	Sum of all pathways	=	5.70E-11	Sum of all pathways	=	4.2E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-07
Methylene chloride	Sum of all pathways	=	4.28E-13	Sum of all pathways	=	1.0E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	2E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.83E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.26E-03	=	[	8.27E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	4.45E-08	=	[	2.91E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	1.07E-06	=	[	7.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Barium	1.48E-05	=	[	9.69E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	3.59E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Boron	9.82E-07	=	[	6.42E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	1.53E-06	=	[	1.00E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	1.33E-06	=	[	8.73E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Copper	2.02E-06	=	[	1.32E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	3.09E-07	=	[	2.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Iron	3.53E-03	=	[	2.31E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	1.41E-06	=	[	9.24E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	5.57E-05	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	3.15E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	3.87E-07	=	[	2.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	1.50E-06	=	[	9.80E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	1.30E-06	=	[	8.51E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	3.35E-07	=	[	2.19E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	3.06E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	7.58E-06	=	[	4.96E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	9.44E-08	=	[	6.18E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	7.93E-06	=	[	5.19E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	6.93E-06	=	[	4.53E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	9.45E-10	=	[	6.18E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Benzene	5.01E-11	=	[	3.28E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	5.76E-11	=	[	3.77E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	1.13E-10	=	[	7.38E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	3.54E-03	=	[	8.27E+03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	1.25E-07	=	[	2.91E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	3.00E-06	=	[	7.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Barium	4.15E-05	=	[	9.69E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	1.01E-07	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Boron	2.75E-06	=	[	6.42E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	4.28E-06	=	[	1.00E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	3.74E-06	=	[	8.73E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Copper	5.65E-06	=	[	1.32E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	8.65E-07	=	[	2.02E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Iron	9.89E-03	=	[	2.31E+04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	3.96E-06	=	[	9.24E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	1.56E-04	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	8.82E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	1.08E-06	=	[	2.53E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	4.20E-06	=	[	9.80E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	3.64E-06	=	[	8.51E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	9.38E-07	=	[	2.19E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	8.56E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	2.12E-05	=	[	4.96E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	2.64E-07	=	[	6.18E-01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	2.22E-05	=	[	5.19E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	1.94E-05	=	[	4.53E+01	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	2.65E-09	=	[	6.18E-03	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Benzene	1.40E-10	=	[	3.28E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	1.61E-10	=	[	3.77E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	3.16E-10	=	[	7.38E-04	x	50	x	1	x	1.00E-06	x	250	x	25	]	/	[	80	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.24E-06	=	[	1.1E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	3.25E-10	=	[	4.0E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	7.82E-09	=	[	9.6E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	1.08E-07	=	[	1.3E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	2.62E-10	=	[	3.2E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	7.17E-09	=	[	8.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.12E-08	=	[	1.4E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	9.75E-09	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.47E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	2.26E-09	=	[	2.8E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	2.58E-05	=	[	3.2E-04	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	1.03E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	4.07E-07	=	[	5.0E-06	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	2.30E-11	=	[	2.8E-10	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	2.83E-09	=	[	3.5E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	1.09E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	9.51E-09	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	2.45E-09	=	[	3.0E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	2.23E-09	=	[	2.7E-08	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	5.54E-08	=	[	6.8E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	6.90E-10	=	[	8.5E-09	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	5.80E-08	=	[	7.1E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	5.06E-08	=	[	6.2E-07	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	6.90E-12	=	[	8.5E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Benzene	3.66E-13	=	[	4.5E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	4.21E-13	=	[	5.2E-12	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	8.24E-13	=	[	1.0E-11	x	250	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	2.59E-05	=	[	1.1E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	9.10E-10	=	[	4.0E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	2.19E-08	=	[	9.6E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	3.03E-07	=	[	1.3E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	7.35E-10	=	[	3.2E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	2.01E-08	=	[	8.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	3.13E-08	=	[	1.4E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	2.73E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	4.13E-08	=	[	1.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	6.32E-09	=	[	2.8E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	7.22E-05	=	[	3.2E-04	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.89E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	1.14E-06	=	[	5.0E-06	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	6.44E-11	=	[	2.8E-10	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	7.91E-09	=	[	3.5E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	3.06E-08	=	[	1.3E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.66E-08	=	[	1.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	6.85E-09	=	[	3.0E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	6.26E-09	=	[	2.7E-08	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	1.55E-07	=	[	6.8E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.93E-09	=	[	8.5E-09	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.62E-07	=	[	7.1E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	1.42E-07	=	[	6.2E-07	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.93E-11	=	[	8.5E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Benzene	1.03E-12	=	[	4.5E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	1.18E-12	=	[	5.2E-12	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	2.31E-12	=	[	1.0E-11	x	250	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Arsenic	2.67E-07	=	[	7.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Arsenic	7.49E-07	=	[	7.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0.03	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,470	x	0.12	x		x	1	x	250	x	25	]	/	[	80	x	9,125	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,470	x	0.12	x	0	x	1	x	250	x	25	]	/	[	80	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.26E-03	x	0.00E+00	=	0.00E+00	3.54E-03	/	1.00E+00	=	3.54E-03
Antimony	4.45E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	4.00E-04	=	3.11E-04
Arsenic	1.07E-06	x	1.50E+00	=	1.61E-06	3.00E-06	/	3.00E-04	=	9.99E-03
Barium	1.48E-05	x	0.00E+00	=	0.00E+00	4.15E-05	/	2.00E-01	=	2.07E-04
Beryllium	3.59E-08	x	0.00E+00	=	0.00E+00	1.01E-07	/	2.00E-03	=	5.03E-05
Boron	9.82E-07	x	0.00E+00	=	0.00E+00	2.75E-06	/	2.00E-01	=	1.37E-05
Chromium	1.53E-06	x	0.00E+00	=	0.00E+00	4.28E-06	/	3.00E-03	=	1.43E-03
Cobalt	1.33E-06	x	0.00E+00	=	0.00E+00	3.74E-06	/	3.00E-04	=	1.25E-02
Copper	2.02E-06	x	0.00E+00	=	0.00E+00	5.65E-06	/	4.00E-02	=	1.41E-04
Fluoride	3.09E-07	x	0.00E+00	=	0.00E+00	8.65E-07	/	4.00E-02	=	2.16E-05
Iron	3.53E-03	x	0.00E+00	=	0.00E+00	9.89E-03	/	7.00E-01	=	1.41E-02
Lithium	1.41E-06	x	0.00E+00	=	0.00E+00	3.96E-06	/	2.00E-03	=	1.98E-03
Manganese	5.57E-05	x	0.00E+00	=	0.00E+00	1.56E-04	/	1.40E-01	=	1.11E-03
Mercury	3.15E-09	x	0.00E+00	=	0.00E+00	8.82E-09	/	0.00E+00	=	NA
Molybdenum	3.87E-07	x	0.00E+00	=	0.00E+00	1.08E-06	/	5.00E-03	=	2.17E-04
Nickel	1.50E-06	x	0.00E+00	=	0.00E+00	4.20E-06	/	2.00E-02	=	2.10E-04
Nitrate	1.30E-06	x	0.00E+00	=	0.00E+00	3.64E-06	/	7.10E+00	=	5.13E-07
Nitrite	3.35E-07	x	0.00E+00	=	0.00E+00	9.38E-07	/	3.00E-01	=	3.13E-06
Selenium	3.06E-07	x	0.00E+00	=	0.00E+00	8.56E-07	/	5.00E-03	=	1.71E-04
Strontium	7.58E-06	x	0.00E+00	=	0.00E+00	2.12E-05	/	6.00E-01	=	3.54E-05
Total Uranium	9.44E-08	x	0.00E+00	=	0.00E+00	2.64E-07	/	3.00E-03	=	8.81E-05
Vanadium	7.93E-06	x	0.00E+00	=	0.00E+00	2.22E-05	/	5.00E-03	=	4.44E-03
Zinc	6.93E-06	x	0.00E+00	=	0.00E+00	1.94E-05	/	3.00E-01	=	6.46E-05
Acetone	9.45E-10	x	0.00E+00	=	0.00E+00	2.65E-09	/	9.00E-01	=	2.94E-09
Benzene	5.01E-11	x	5.50E-02	=	2.76E-12	1.40E-10	/	4.00E-03	=	3.51E-08
Styrene	5.76E-11	x	0.00E+00	=	0.00E+00	1.61E-10	/	2.00E-01	=	8.07E-10
Toluene	1.13E-10	x	0.00E+00	=	0.00E+00	3.16E-10	/	8.00E-02	=	3.95E-09
			Pathway total	=	1.61E-06			Pathway total	=	5.06E-02

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.24E-06	x		=	NA	2.59E-05	/[	5.00E-03	x	1000	]=	5.17E-06
Antimony	3.25E-10	x		=	NA	9.10E-10	/[		x	1000	]=	NA
Arsenic	7.82E-09	x	4.30E-03	=	3.36E-11	2.19E-08	/[	1.50E-05	x	1000	]=	1.46E-06
Barium	1.08E-07	x		=	NA	3.03E-07	/[	5.00E-04	x	1000	]=	6.06E-07
Beryllium	2.62E-10	x	2.40E-03	=	6.30E-13	7.35E-10	/[	2.00E-05	x	1000	]=	3.67E-08
Boron	7.17E-09	x	0.00E+00	=	0.00E+00	2.01E-08	/[	2.00E-02	x	1000	]=	1.00E-09
Chromium	1.12E-08	x	8.40E-02	=	9.38E-10	3.13E-08	/[	1.00E-04	x	1000	]=	3.13E-07
Cobalt	9.75E-09	x	9.00E-03	=	8.78E-11	2.73E-08	/[	6.00E-06	x	1000	]=	4.55E-06
Copper	1.47E-08	x		=	NA	4.13E-08	/[		x	1000	]=	NA
Fluoride	2.26E-09	x		=	NA	6.32E-09	/[	1.30E-02	x	1000	]=	4.86E-10
Iron	2.58E-05	x		=	NA	7.22E-05	/[		x	1000	]=	NA
Lithium	1.03E-08	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Manganese	4.07E-07	x		=	NA	1.14E-06	/[	5.00E-05	x	1000	]=	2.28E-05
Mercury	2.30E-11	x	0.00E+00	=	0.00E+00	6.44E-11	/[	3.00E-04	x	1000	]=	2.15E-10
Molybdenum	2.83E-09	x	0.00E+00	=	0.00E+00	7.91E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	1.09E-08	x	2.60E-04	=	2.85E-12	3.06E-08	/[	9.00E-05	x	1000	]=	3.41E-07
Nitrate	9.51E-09	x		=	NA	2.66E-08	/[		x	1000	]=	NA
Nitrite	2.45E-09	x		=	NA	6.85E-09	/[		x	1000	]=	NA
Selenium	2.23E-09	x	0.00E+00	=	0.00E+00	6.26E-09	/[	2.00E-02	x	1000	]=	3.13E-10
Strontium	5.54E-08	x		=	NA	1.55E-07	/[		x	1000	]=	NA
Total Uranium	6.90E-10	x		=	NA	1.93E-09	/[	4.00E-05	x	1000	]=	4.83E-08
Vanadium	5.80E-08	x		=	NA	1.62E-07	/[	1.00E-04	x	1000	]=	1.62E-06
Zinc	5.06E-08	x		=	NA	1.42E-07	/[		x	1000	]=	NA
Acetone	6.90E-12	x	0.00E+00	=	0.00E+00	1.93E-11	/[	3.10E+01	x	1000	]=	6.23E-16
Benzene	3.66E-13	x	7.80E-06	=	2.86E-18	1.03E-12	/[	3.00E-02	x	1000	]=	3.42E-14
Styrene	4.21E-13	x	0.00E+00	=	0.00E+00	1.18E-12	/[	1.00E+00	x	1000	]=	1.18E-15
Toluene	8.24E-13	x	0.00E+00	=	0.00E+00	2.31E-12	/[	5.00E+00	x	1000	]=	4.62E-16
			Pathway total =		1.06E-09					Pathway total =		3.69E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.67E-07	x	1.50E+00	=	4.01E-07	7.49E-07	/	3.00E-04	=	2.50E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		**4.01E-07**			Pathway total =		2.50E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-04
Arsenic	Sum of all pathways	=	2.01E-06	Sum of all pathways	=	1.2E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Beryllium	Sum of all pathways	=	6.30E-13	Sum of all pathways	=	5.0E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Chromium	Sum of all pathways	=	9.38E-10	Sum of all pathways	=	1.4E-03
Cobalt	Sum of all pathways	=	8.78E-11	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-10
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Nickel	Sum of all pathways	=	2.85E-12	Sum of all pathways	=	2.1E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-09
Benzene	Sum of all pathways	=	2.76E-12	Sum of all pathways	=	3.5E-08
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	2E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.31E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Adult Industrial Worker

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	9E-07	5E-06	1E-06	8E-07	1E-06	2E-06	8E-07	1E-06	1E-06	2E-06
Inhalation	1E-09	1E-09	2E-09	9E-10	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	2E-07	1E-06	3E-07	2E-07	3E-07	5E-07	2E-07	3E-07	3E-07	4E-07
ELCR	1E-06	6E-06	2E-06	1E-06	1E-06	2E-06	1E-06	1E-06	2E-06	2E-06
Major Risk Contributors	None									
	Noncancer Hazard - Nonradiological COPCs									
Soil Ingestion	5E-02	8E-02	5E-02	5E-02	5E-02	5E-02	4E-02	5E-02	6E-02	5E-02
Inhalation	4E-05	5E-05	5E-05	4E-05	4E-05	4E-05	3E-05	4E-05	4E-05	4E-05
Dermal Contact	2E-03	7E-03	2E-03	1E-03	2E-03	3E-03	1E-03	2E-03	3E-03	2E-03
HI	0.05	0.1	0.1	0.05	0.05	0.1	0.04	0.05	0.1	0.1
Major Hazard Contributors	None									

Appendix C

Attachment C-2: Results of Nonradiological Risk Assessment under Industrial Worker Scenario Based on MTCA Method C Standard

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	5.75E-04	=	[	7.55E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	2.02E-08	=	[	2.65E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	2.86E-07	=	[	3.75E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	6.48E-06	=	[	8.50E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	7.37E-09	=	[	9.67E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	7.27E-07	=	[	9.54E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.93E-07	=	[	9.09E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	9.72E-07	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.70E-07	=	[	2.23E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.83E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	6.35E-07	=	[	8.33E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.70E-05	=	[	3.54E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	8.26E-07	=	[	1.08E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	6.91E-07	=	[	9.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	7.05E-08	=	[	9.25E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	3.68E-09	=	[	4.83E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.88E-06	=	[	3.77E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Tin	8.84E-07	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	4.40E-08	=	[	5.77E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	4.57E-06	=	[	6.00E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.47E-06	=	[	4.56E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Diethylphthalate	2.59E-08	=	[	3.40E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Aroclor-1254	5.74E-10	=	[	7.54E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	2.16E-03	=	[	7.55E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	7.58E-08	=	[	2.65E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	1.07E-06	=	[	3.75E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.43E-05	=	[	8.50E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	2.76E-08	=	[	9.67E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	2.72E-06	=	[	9.54E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.60E-06	=	[	9.09E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.64E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	6.36E-07	=	[	2.23E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.88E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.38E-06	=	[	8.33E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.01E-04	=	[	3.54E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.10E-06	=	[	1.08E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	2.59E-06	=	[	9.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	2.64E-07	=	[	9.25E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	1.38E-08	=	[	4.83E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	1.08E-05	=	[	3.77E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Tin	3.31E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	1.65E-07	=	[	5.77E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.71E-05	=	[	6.00E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.30E-05	=	[	4.56E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Diethylphthalate	9.71E-08	=	[	3.40E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Aroclor-1254	2.15E-09	=	[	7.54E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	

CARCINOGENIC EFFECTS

Aluminum	1.18E-08	=	[	1.0E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.15E-13	=	[	3.6E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.87E-12	=	[	5.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.33E-10	=	[	1.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.51E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.49E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.42E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.00E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.48E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.77E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.30E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.54E-10	=	[	4.8E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.70E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.42E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	1.45E-12	=	[	1.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	7.56E-14	=	[	6.6E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.91E-11	=	[	5.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	1.82E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	9.04E-13	=	[	7.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.39E-11	=	[	8.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.14E-11	=	[	6.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Diethylphthalate	5.32E-13	=	[	4.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1254	4.92E-13	=	[	1.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	24	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	

NONCARCINOGENIC EFFECTS

Aluminum	2.95E-08	=	[	1.0E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	1.04E-12	=	[	3.6E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	1.47E-11	=	[	5.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.33E-10	=	[	1.2E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	3.79E-13	=	[	1.3E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	3.73E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.56E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	4.99E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	8.71E-12	=	[	3.0E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.42E-08	=	[	3.3E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	3.26E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.39E-09	=	[	4.8E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	4.24E-11	=	[	1.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	3.55E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	3.62E-12	=	[	1.3E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	1.89E-13	=	[	6.6E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.48E-10	=	[	5.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Tin	4.54E-11	=	[	1.6E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.26E-12	=	[	7.9E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.35E-10	=	[	8.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.78E-10	=	[	6.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Diethylphthalate	1.33E-12	=	[	4.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Aroclor-1254	2.95E-14	=	[	1.0E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.75E-04	x	0.00E+00	=	0.00E+00	2.16E-03	/	1.00E+00	=	2.16E-03
Antimony	2.02E-08	x	0.00E+00	=	0.00E+00	7.58E-08	/	4.00E-04	=	1.90E-04
Arsenic	2.86E-07	x	1.50E+00	=	4.29E-07	1.07E-06	/	3.00E-04	=	3.57E-03
Barium	6.48E-06	x	0.00E+00	=	0.00E+00	2.43E-05	/	2.00E-01	=	1.21E-04
Cadmium	7.37E-09	x	0.00E+00	=	0.00E+00	2.76E-08	/	1.00E-03	=	2.76E-05
Chromium	7.27E-07	x	0.00E+00	=	0.00E+00	2.72E-06	/	3.00E-03	=	9.08E-04
Cobalt	6.93E-07	x	0.00E+00	=	0.00E+00	2.60E-06	/	3.00E-04	=	8.66E-03
Copper	9.72E-07	x	0.00E+00	=	0.00E+00	3.64E-06	/	4.00E-02	=	9.11E-05
Fluoride	1.70E-07	x	0.00E+00	=	0.00E+00	6.36E-07	/	4.00E-02	=	1.59E-05
Iron	1.83E-03	x	0.00E+00	=	0.00E+00	6.88E-03	/	7.00E-01	=	9.83E-03
Lithium	6.35E-07	x	0.00E+00	=	0.00E+00	2.38E-06	/	2.00E-03	=	1.19E-03
Manganese	2.70E-05	x	0.00E+00	=	0.00E+00	1.01E-04	/	1.40E-01	=	7.22E-04
Nickel	8.26E-07	x	0.00E+00	=	0.00E+00	3.10E-06	/	2.00E-02	=	1.55E-04
Nitrate	6.91E-07	x	0.00E+00	=	0.00E+00	2.59E-06	/	7.10E+00	=	3.65E-07
Nitrite	7.05E-08	x	0.00E+00	=	0.00E+00	2.64E-07	/	3.00E-01	=	8.81E-07
Silver	3.68E-09	x	0.00E+00	=	0.00E+00	1.38E-08	/	5.00E-03	=	2.76E-06
Strontium	2.88E-06	x	0.00E+00	=	0.00E+00	1.08E-05	/	6.00E-01	=	1.80E-05
Tin	8.84E-07	x	0.00E+00	=	0.00E+00	3.31E-06	/	6.00E-01	=	5.52E-06
Total Uranium	4.40E-08	x	0.00E+00	=	0.00E+00	1.65E-07	/	3.00E-03	=	5.50E-05
Vanadium	4.57E-06	x	0.00E+00	=	0.00E+00	1.71E-05	/	5.00E-03	=	3.43E-03
Zinc	3.47E-06	x	0.00E+00	=	0.00E+00	1.30E-05	/	3.00E-01	=	4.34E-05
Diethylphthalate	2.59E-08	x	0.00E+00	=	0.00E+00	9.71E-08	/	8.00E-01	=	1.21E-07
Aroclor-1254	5.74E-10	x	2.00E+00	=	1.15E-09	2.15E-09	/	2.00E-05	=	1.08E-04
			Pathway total	=	4.30E-07			Pathway total	=	3.13E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.18E-08	x		=	0.00E+00	2.95E-08	/	1.43E-03	=	2.07E-05
Antimony	4.15E-13	x		=	0.00E+00	1.04E-12	/		=	NA
Arsenic	5.87E-12	x	1.51E+01	=	8.84E-11	1.47E-11	/	4.29E-06	=	3.43E-06
Barium	1.33E-10	x		=	0.00E+00	3.33E-10	/	1.43E-04	=	2.33E-06
Cadmium	1.51E-13	x	6.30E+00	=	9.54E-13	3.79E-13	/	2.86E-06	=	1.33E-07
Chromium	1.49E-11	x		=	0.00E+00	3.73E-11	/		=	NA
Cobalt	1.42E-11	x	3.15E+01	=	4.48E-10	3.56E-11	/	1.71E-06	=	2.08E-05
Copper	2.00E-11	x		=	0.00E+00	4.99E-11	/		=	NA
Fluoride	3.48E-12	x		=	0.00E+00	8.71E-12	/	3.71E-03	=	2.34E-09
Iron	3.77E-08	x		=	0.00E+00	9.42E-08	/		=	NA
Lithium	1.30E-11	x		=	0.00E+00	3.26E-11	/		=	NA
Manganese	5.54E-10	x		=	0.00E+00	1.39E-09	/	1.43E-05	=	9.70E-05
Nickel	1.70E-11	x	9.10E-01	=	1.54E-11	4.24E-11	/	2.57E-05	=	1.65E-06
Nitrate	1.42E-11	x		=	0.00E+00	3.55E-11	/		=	NA
Nitrite	1.45E-12	x		=	0.00E+00	3.62E-12	/		=	NA
Silver	7.56E-14	x		=	0.00E+00	1.89E-13	/		=	NA
Strontium	5.91E-11	x		=	0.00E+00	1.48E-10	/		=	NA
Tin	1.82E-11	x		=	0.00E+00	4.54E-11	/		=	NA
Total Uranium	9.04E-13	x		=	0.00E+00	2.26E-12	/	1.14E-05	=	1.98E-07
Vanadium	9.39E-11	x		=	0.00E+00	2.35E-10	/	2.86E-05	=	8.22E-06
Zinc	7.14E-11	x		=	0.00E+00	1.78E-10	/		=	NA
Diethylphthalate	5.32E-13	x		=	0.00E+00	1.33E-12	/		=	NA
Aroclor-1254	4.92E-13	x	2.00E+00	=	9.81E-13	2.95E-14	/		=	NA
			Pathway total =		5.54E-10			Pathway total =		1.54E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Arsenic	Sum of all pathways	=	4.29E-07	Sum of all pathways	=	3.6E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Cadmium	Sum of all pathways	=	9.54E-13	Sum of all pathways	=	2.8E-05
Chromium	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-04
Cobalt	Sum of all pathways	=	4.48E-10	Sum of all pathways	=	8.7E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	9.8E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-04
Nickel	Sum of all pathways	=	1.54E-11	Sum of all pathways	=	1.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-07
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-05
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-07
Aroclor-1254	Sum of all pathways	=	1.15E-09	Sum of all pathways	=	1.1E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	4E-07	All Pathways and Chemicals	=	3.1E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	7.25E-04	=	[	9.51E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	5.49E-08	=	[	7.21E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	1.62E-06	=	[	2.12E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	7.53E-06	=	[	9.88E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	3.07E-08	=	[	4.03E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	1.14E-08	=	[	1.50E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	9.75E-07	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	8.38E-07	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	1.38E-06	=	[	1.81E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.74E-07	=	[	2.29E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	2.18E-03	=	[	2.86E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	9.22E-07	=	[	1.21E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	3.42E-05	=	[	4.49E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	3.86E-10	=	[	5.06E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	9.90E-07	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	1.33E-06	=	[	1.74E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	1.61E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	6.10E-09	=	[	8.00E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	3.41E-06	=	[	4.47E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	6.44E-08	=	[	8.45E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	5.98E-06	=	[	7.85E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.89E-06	=	[	5.11E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	6.15E-09	=	[	8.07E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	2.72E-03	=	[	9.51E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	2.06E-07	=	[	7.21E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	6.06E-06	=	[	2.12E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.82E-05	=	[	9.88E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	1.15E-07	=	[	4.03E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	4.29E-08	=	[	1.50E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	3.66E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	3.14E-06	=	[	1.10E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	5.17E-06	=	[	1.81E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	6.54E-07	=	[	2.29E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	8.17E-03	=	[	2.86E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	3.46E-06	=	[	1.21E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.28E-04	=	[	4.49E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	1.45E-09	=	[	5.06E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.71E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	4.97E-06	=	[	1.74E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	6.03E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	2.29E-08	=	[	8.00E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	1.28E-05	=	[	4.47E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	2.42E-07	=	[	8.45E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	2.24E-05	=	[	7.85E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.46E-05	=	[	5.11E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	2.31E-08	=	[	8.07E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.49E-08	=	[	1.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	1.13E-12	=	[	9.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	3.32E-11	=	[	2.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.55E-10	=	[	1.4E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	6.31E-13	=	[	5.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	2.35E-13	=	[	2.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.00E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.72E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.83E-11	=	[	2.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.59E-12	=	[	3.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	4.48E-08	=	[	3.9E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.89E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	7.03E-10	=	[	6.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	7.92E-15	=	[	6.9E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.04E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	2.72E-11	=	[	2.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.30E-12	=	[	2.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.25E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	7.00E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.32E-12	=	[	1.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.23E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	8.00E-11	=	[	7.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.26E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	3.72E-08	=	[	1.3E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	2.82E-12	=	[	9.9E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	8.30E-11	=	[	2.9E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.87E-10	=	[	1.4E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	1.58E-12	=	[	5.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	5.87E-13	=	[	2.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	5.01E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	4.31E-11	=	[	1.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	7.08E-11	=	[	2.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	8.96E-12	=	[	3.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	1.12E-07	=	[	3.9E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	4.74E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.76E-09	=	[	6.2E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	1.98E-14	=	[	6.9E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	5.09E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	6.81E-11	=	[	2.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	8.26E-12	=	[	2.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	3.13E-13	=	[	1.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.75E-10	=	[	6.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	3.31E-12	=	[	1.2E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	3.07E-10	=	[	1.1E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	2.00E-10	=	[	7.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	3.16E-13	=	[	1.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.25E-04	x	0.00E+00	=	0.00E+00	2.72E-03	/	1.00E+00	=	2.72E-03
Antimony	5.49E-08	x	0.00E+00	=	0.00E+00	2.06E-07	/	4.00E-04	=	5.15E-04
Arsenic	1.62E-06	x	1.50E+00	=	2.42E-06	6.06E-06	/	3.00E-04	=	2.02E-02
Barium	7.53E-06	x	0.00E+00	=	0.00E+00	2.82E-05	/	2.00E-01	=	1.41E-04
Beryllium	3.07E-08	x	0.00E+00	=	0.00E+00	1.15E-07	/	2.00E-03	=	5.76E-05
Cadmium	1.14E-08	x	0.00E+00	=	0.00E+00	4.29E-08	/	1.00E-03	=	4.29E-05
Chromium	9.75E-07	x	0.00E+00	=	0.00E+00	3.66E-06	/	3.00E-03	=	1.22E-03
Cobalt	8.38E-07	x	0.00E+00	=	0.00E+00	3.14E-06	/	3.00E-04	=	1.05E-02
Copper	1.38E-06	x	0.00E+00	=	0.00E+00	5.17E-06	/	4.00E-02	=	1.29E-04
Fluoride	1.74E-07	x	0.00E+00	=	0.00E+00	6.54E-07	/	4.00E-02	=	1.64E-05
Iron	2.18E-03	x	0.00E+00	=	0.00E+00	8.17E-03	/	7.00E-01	=	1.17E-02
Lithium	9.22E-07	x	0.00E+00	=	0.00E+00	3.46E-06	/	2.00E-03	=	1.73E-03
Manganese	3.42E-05	x	0.00E+00	=	0.00E+00	1.28E-04	/	1.40E-01	=	9.16E-04
Mercury	3.86E-10	x	0.00E+00	=	0.00E+00	1.45E-09	/	0.00E+00	=	**NA**
Nickel	9.90E-07	x	0.00E+00	=	0.00E+00	3.71E-06	/	2.00E-02	=	1.86E-04
Nitrate	1.33E-06	x	0.00E+00	=	0.00E+00	4.97E-06	/	7.10E+00	=	7.00E-07
Nitrite	1.61E-07	x	0.00E+00	=	0.00E+00	6.03E-07	/	3.00E-01	=	2.01E-06
Silver	6.10E-09	x	0.00E+00	=	0.00E+00	2.29E-08	/	5.00E-03	=	4.57E-06
Strontium	3.41E-06	x	0.00E+00	=	0.00E+00	1.28E-05	/	6.00E-01	=	2.13E-05
Total Uranium	6.44E-08	x	0.00E+00	=	0.00E+00	2.42E-07	/	3.00E-03	=	8.05E-05
Vanadium	5.98E-06	x	0.00E+00	=	0.00E+00	2.24E-05	/	5.00E-03	=	4.49E-03
Zinc	3.89E-06	x	0.00E+00		0.00E+00	1.46E-05	/	3.00E-01	=	4.87E-05
Butylbenzylphthalate	6.15E-09	x	1.90E-03	=	1.17E-11	2.31E-08	/	2.00E-01	=	1.15E-07
			Pathway total	=	2.42E-06			Pathway total	=	5.47E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.49E-08	x	0.00E+00	=	0.00E+00	3.72E-08	/	1.43E-03	=	2.61E-05
Antimony	1.13E-12	x	0.00E+00	=	0.00E+00	2.82E-12	/	0.00E+00	=	NA
Arsenic	3.32E-11	x	1.51E+01	=	5.00E-10	8.30E-11	/	4.29E-06	=	1.94E-05
Barium	1.55E-10	x	0.00E+00	=	0.00E+00	3.87E-10	/	1.43E-04	=	2.71E-06
Beryllium	6.31E-13	x	8.40E+00	=	5.30E-12	1.58E-12	/	5.71E-06	=	2.76E-07
Cadmium	2.35E-13	x	6.30E+00	=	1.48E-12	5.87E-13	/	2.86E-06	=	2.05E-07
Chromium	2.00E-11	x	0.00E+00	=	0.00E+00	5.01E-11	/	0.00E+00	=	NA
Cobalt	1.72E-11	x	3.15E+01	=	5.42E-10	4.31E-11	/	1.71E-06	=	2.51E-05
Copper	2.83E-11	x	0.00E+00	=	0.00E+00	7.08E-11	/	0.00E+00	=	NA
Fluoride	3.59E-12	x	0.00E+00	=	0.00E+00	8.96E-12	/	3.71E-03	=	2.41E-09
Iron	4.48E-08	x	0.00E+00	=	0.00E+00	1.12E-07	/	0.00E+00	=	NA
Lithium	1.89E-11	x	0.00E+00	=	0.00E+00	4.74E-11	/	0.00E+00	=	NA
Manganese	7.03E-10	x	0.00E+00	=	0.00E+00	1.76E-09	/	1.43E-05	=	1.23E-04
Mercury	7.92E-15	x	0.00E+00	=	0.00E+00	1.98E-14	/	8.57E-05	=	2.31E-10
Nickel	2.04E-11	x	9.10E-01	=	1.85E-11	5.09E-11	/	2.57E-05	=	1.98E-06
Nitrate	2.72E-11	x	0.00E+00	=	0.00E+00	6.81E-11	/	0.00E+00	=	NA
Nitrite	3.30E-12	x	0.00E+00	=	0.00E+00	8.26E-12	/	0.00E+00	=	NA
Silver	1.25E-13	x	0.00E+00	=	0.00E+00	3.13E-13	/	0.00E+00	=	NA
Strontium	7.00E-11	x	0.00E+00	=	0.00E+00	1.75E-10	/	0.00E+00	=	NA
Total Uranium	1.32E-12	x	0.00E+00	=	0.00E+00	3.31E-12	/	1.14E-05	=	2.90E-07
Vanadium	1.23E-10	x	0.00E+00	=	0.00E+00	3.07E-10	/	2.86E-05	=	1.08E-05
Zinc	8.00E-11	x	0.00E+00			2.00E-10	/	0.00E+00	=	NA
Butylbenzylphthalate	1.26E-13	x	0.00E+00	=	0.00E+00	3.16E-13	/	0.00E+00	=	NA
			Pathway total =		1.07E-09			Pathway total =		2.10E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.7E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-04
Arsenic	Sum of all pathways	=	**2.42E-06**	Sum of all pathways	=	2.0E-02
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-04
Beryllium	Sum of all pathways	=	5.30E-12	Sum of all pathways	=	5.8E-05
Cadmium	Sum of all pathways	=	1.48E-12	Sum of all pathways	=	4.3E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-03
Cobalt	Sum of all pathways	=	5.42E-10	Sum of all pathways	=	1.1E-02
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-02
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.0E-03
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.3E-10
Nickel	Sum of all pathways	=	1.85E-11	Sum of all pathways	=	1.9E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.0E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-06
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.6E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-05
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.1E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.5E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.9E-05
Butylbenzylphthalate	Sum of all pathways	=	1.17E-11	Sum of all pathways	=	1.2E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	2.4E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.5E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation Units	CDIingestion = mg/kg-day	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																				
Aluminum	5.65E-04	=	7.42E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	1.36E-08	=	1.78E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	3.96E-07	=	5.20E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	5.97E-06	=	7.84E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	1.21E-08	=	1.59E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Boron	2.54E-07	=	3.34E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	2.48E-07	=	3.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	1.31E-06	=	1.72E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.72E-07	=	8.82E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	1.26E-06	=	1.65E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.13E-07	=	1.48E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.84E-03	=	2.42E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	6.96E-07	=	9.13E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	3.77E-05	=	4.95E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	1.77E-09	=	2.32E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	9.45E-07	=	1.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	3.82E-07	=	5.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	1.07E-07	=	1.40E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Selenium	4.27E-08	=	5.60E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	6.48E-09	=	8.50E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.64E-06	=	3.47E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	6.30E-08	=	8.27E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	4.48E-06	=	5.88E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.41E-06	=	4.48E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Acetone	5.05E-10	=	6.63E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	9.45E-09	=	1.24E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Toluene	2.57E-11	=	3.37E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Aldrin	1.52E-10	=	2.00E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
NONCARCINOGENIC EFFECTS																				
Aluminum	2.12E-03	=	[	7.42E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	5.09E-08	=	[	1.78E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	1.49E-06	=	[	5.20E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.24E-05	=	[	7.84E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	4.54E-08	=	[	1.59E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Boron	9.54E-07	=	[	3.34E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	9.31E-07	=	[	3.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	4.91E-06	=	[	1.72E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.52E-06	=	[	8.82E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	4.71E-06	=	[	1.65E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	4.23E-07	=	[	1.48E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.91E-03	=	[	2.42E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.61E-06	=	[	9.13E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.41E-04	=	[	4.95E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	6.63E-09	=	[	2.32E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.54E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	1.43E-06	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	4.00E-07	=	[	1.40E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Selenium	1.60E-07	=	[	5.60E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	2.43E-08	=	[	8.50E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	9.91E-06	=	[	3.47E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	2.36E-07	=	[	8.27E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.68E-05	=	[	5.88E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.28E-05	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Acetone	1.89E-09	=	[	6.63E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	3.54E-08	=	[	1.24E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Toluene	9.63E-11	=	[	3.37E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Aldrin	5.71E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.16E-08	=	[	1.0E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	2.79E-13	=	[	2.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	8.14E-12	=	[	7.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.23E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	2.49E-13	=	[	2.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	5.23E-12	=	[	4.6E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	5.10E-12	=	[	4.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.69E-11	=	[	2.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.38E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.58E-11	=	[	2.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.32E-12	=	[	2.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.79E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.43E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	7.75E-10	=	[	6.8E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.63E-14	=	[	3.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.94E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	7.86E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	2.19E-12	=	[	1.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	8.77E-13	=	[	7.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.33E-13	=	[	1.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.43E-11	=	[	4.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.29E-12	=	[	1.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.21E-11	=	[	8.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.01E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	1.04E-14	=	[	9.1E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.94E-13	=	[	1.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	5.28E-16	=	[	4.6E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aldrin	3.13E-15	=	[	2.7E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	2.90E-08	=	[	1.0E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	6.97E-13	=	[	2.4E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	2.04E-11	=	[	7.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.07E-10	=	[	1.1E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	6.22E-13	=	[	2.2E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Boron	1.31E-11	=	[	4.6E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	1.28E-11	=	[	4.5E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	6.73E-11	=	[	2.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.45E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	6.46E-11	=	[	2.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	5.79E-12	=	[	2.0E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.47E-08	=	[	3.3E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	3.57E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.94E-09	=	[	6.8E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	9.08E-14	=	[	3.2E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	4.85E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	1.96E-11	=	[	6.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	5.48E-12	=	[	1.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Selenium	2.19E-12	=	[	7.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	3.33E-13	=	[	1.2E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.36E-10	=	[	4.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	3.24E-12	=	[	1.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.30E-10	=	[	8.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.75E-10	=	[	6.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Acetone	2.59E-14	=	[	9.1E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	4.85E-13	=	[	1.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Toluene	1.32E-15	=	[	4.6E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Aldrin	7.83E-15	=	[	2.7E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.65E-04	x	0.00E+00	=	0.00E+00	2.12E-03	/	1.00E+00	=	2.12E-03
Antimony	1.36E-08	x	0.00E+00	=	0.00E+00	5.09E-08	/	4.00E-04	=	1.27E-04
Arsenic	3.96E-07	x	1.50E+00	=	5.94E-07	1.49E-06	/	3.00E-04	=	4.95E-03
Barium	5.97E-06	x	0.00E+00	=	0.00E+00	2.24E-05	/	2.00E-01	=	1.12E-04
Beryllium	1.21E-08	x	0.00E+00	=	0.00E+00	4.54E-08	/	2.00E-03	=	2.27E-05
Boron	2.54E-07	x	0.00E+00	=	0.00E+00	9.54E-07	/	2.00E-01	=	4.77E-06
Cadmium	2.48E-07	x	0.00E+00	=	0.00E+00	9.31E-07	/	1.00E-03	=	9.31E-04
Chromium	1.31E-06	x	0.00E+00	=	0.00E+00	4.91E-06	/	3.00E-03	=	1.64E-03
Cobalt	6.72E-07	x	0.00E+00	=	0.00E+00	2.52E-06	/	3.00E-04	=	8.40E-03
Copper	1.26E-06	x	0.00E+00	=	0.00E+00	4.71E-06	/	4.00E-02	=	1.18E-04
Fluoride	1.13E-07	x	0.00E+00	=	0.00E+00	4.23E-07	/	4.00E-02	=	1.06E-05
Iron	1.84E-03	x	0.00E+00	=	0.00E+00	6.91E-03	/	7.00E-01	=	9.88E-03
Lithium	6.96E-07	x	0.00E+00	=	0.00E+00	2.61E-06	/	2.00E-03	=	1.30E-03
Manganese	3.77E-05	x	0.00E+00	=	0.00E+00	1.41E-04	/	1.40E-01	=	1.01E-03
Mercury	1.77E-09	x	0.00E+00	=	0.00E+00	6.63E-09	/	0.00E+00	=	NA
Nickel	9.45E-07	x	0.00E+00	=	0.00E+00	3.54E-06	/	2.00E-02	=	1.77E-04
Nitrate	3.82E-07	x	0.00E+00	=	0.00E+00	1.43E-06	/	7.10E+00	=	2.02E-07
Nitrite	1.07E-07	x	0.00E+00	=	0.00E+00	4.00E-07	/	3.00E-01	=	1.33E-06
Selenium	4.27E-08	x	0.00E+00	=	0.00E+00	1.60E-07	/	5.00E-03	=	3.20E-05
Silver	6.48E-09	x	0.00E+00	=	0.00E+00	2.43E-08	/	5.00E-03	=	4.86E-06
Strontium	2.64E-06	x	0.00E+00	=	0.00E+00	9.91E-06	/	6.00E-01	=	1.65E-05
Total Uranium	6.30E-08	x	0.00E+00	=	0.00E+00	2.36E-07	/	3.00E-03	=	7.88E-05
Vanadium	4.48E-06	x	0.00E+00	=	0.00E+00	1.68E-05	/	5.00E-03	=	3.36E-03
Zinc	3.41E-06	x	0.00E+00	=	0.00E+00	1.28E-05	/	3.00E-01	=	4.27E-05
Acetone	5.05E-10	x	0.00E+00	=	0.00E+00	1.89E-09	/	9.00E-01	=	2.10E-09
Butylbenzylphthalate	9.45E-09	x	1.90E-03	=	1.80E-11	3.54E-08	/	2.00E-01	=	1.77E-07
Toluene	2.57E-11	x	0.00E+00	=	0.00E+00	9.63E-11	/	8.00E-02	=	1.20E-09
Aldrin	1.52E-10	x	1.70E+01	=	2.59E-09	5.71E-10	/	3.00E-05	=	1.90E-05
			Pathway total	=	5.97E-07			Pathway total	=	3.44E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.16E-08	x	0.00E+00	=	0.00E+00	2.90E-08	/	1.43E-03	=	2.03E-05
Antimony	2.79E-13	x	0.00E+00	=	0.00E+00	6.97E-13	/	0.00E+00	=	NA
Arsenic	8.14E-12	x	1.51E+01	=	1.23E-10	2.04E-11	/	4.29E-06	=	4.75E-06
Barium	1.23E-10	x	0.00E+00	=	0.00E+00	3.07E-10	/	1.43E-04	=	2.15E-06
Beryllium	2.49E-13	x	8.40E+00	=	2.09E-12	6.22E-13	/	5.71E-06	=	1.09E-07
Boron	5.23E-12	x	0.00E+00	=	0.00E+00	1.31E-11	/	5.71E-03	=	2.29E-09
Cadmium	5.10E-12	x	6.30E+00	=	3.22E-11	1.28E-11	/	2.86E-06	=	4.47E-06
Chromium	2.69E-11	x	0.00E+00	=	0.00E+00	6.73E-11	/	0.00E+00	=	NA
Cobalt	1.38E-11	x	3.15E+01	=	4.35E-10	3.45E-11	/	1.71E-06	=	2.01E-05
Copper	2.58E-11	x	0.00E+00	=	0.00E+00	6.46E-11	/	0.00E+00	=	NA
Fluoride	2.32E-12	x	0.00E+00	=	0.00E+00	5.79E-12	/	3.71E-03	=	1.56E-09
Iron	3.79E-08	x	0.00E+00	=	0.00E+00	9.47E-08	/	0.00E+00	=	NA
Lithium	1.43E-11	x	0.00E+00	=	0.00E+00	3.57E-11	/	0.00E+00	=	NA
Manganese	7.75E-10	x	0.00E+00	=	0.00E+00	1.94E-09	/	1.43E-05	=	1.36E-04
Mercury	3.63E-14	x	0.00E+00	=	0.00E+00	9.08E-14	/	8.57E-05	=	1.06E-09
Nickel	1.94E-11	x	9.10E-01	=	1.77E-11	4.85E-11	/	2.57E-05	=	1.89E-06
Nitrate	7.86E-12	x	0.00E+00	=	0.00E+00	1.96E-11	/	0.00E+00	=	NA
Nitrite	2.19E-12	x	0.00E+00	=	0.00E+00	5.48E-12	/	0.00E+00	=	NA
Selenium	8.77E-13	x	0.00E+00	=	0.00E+00	2.19E-12	/	5.71E-03	=	3.84E-10
Silver	1.33E-13	x	0.00E+00	=	0.00E+00	3.33E-13	/	0.00E+00	=	NA
Strontium	5.43E-11	x	0.00E+00	=	0.00E+00	1.36E-10	/	0.00E+00	=	NA
Total Uranium	1.29E-12	x	0.00E+00	=	0.00E+00	3.24E-12	/	1.14E-05	=	2.83E-07
Vanadium	9.21E-11	x	0.00E+00	=	0.00E+00	2.30E-10	/	2.86E-05	=	8.05E-06
Zinc	7.01E-11	x	0.00E+00	=	0.00E+00	1.75E-10	/	0.00E+00	=	NA
Acetone	1.04E-14	x	0.00E+00	=	0.00E+00	2.59E-14	/	8.86E+00	=	2.93E-15
Butylbenzylphthalate	1.94E-13	x	0.00E+00	=	0.00E+00	4.85E-13	/	0.00E+00	=	NA
Toluene	5.28E-16	x	0.00E+00	=	0.00E+00	1.32E-15	/	1.43E+00	=	9.23E-16
Aldrin	3.13E-15	x	1.72E+01	=	5.37E-14	7.83E-15	/	0.00E+00	=	NA
			Pathway total =		6.09E-10			Pathway total =		1.98E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04
Arsenic	Sum of all pathways	=	5.94E-07	Sum of all pathways	=	5.0E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-04
Beryllium	Sum of all pathways	=	2.09E-12	Sum of all pathways	=	2.3E-05
Boron	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.8E-06
Cadmium	Sum of all pathways	=	3.22E-11	Sum of all pathways	=	9.4E-04
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-03
Cobalt	Sum of all pathways	=	4.35E-10	Sum of all pathways	=	8.4E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.9E-03
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-09
Nickel	Sum of all pathways	=	1.77E-11	Sum of all pathways	=	1.8E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-06
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.2E-05
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.9E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-05
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.9E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.4E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.3E-05
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-09
Butylbenzylphthalate	Sum of all pathways	=	1.80E-11	Sum of all pathways	=	1.8E-07
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-09
Aldrin	Sum of all pathways	=	2.59E-09	Sum of all pathways	=	1.9E-05
						3.5E-02
	Total Carcinogenic Risk All Pathways and Chemicals	=	6.0E-07	Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.46E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
CARCINOGENIC EFFECTS																					
Aluminum	5.15E-04	=	[	6.76E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	1.88E-08	=	[	2.47E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	2.66E-07	=	[	3.49E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	7.17E-06	=	[	9.41E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	2.27E-08	=	[	2.98E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	8.88E-09	=	[	1.17E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	6.84E-07	=	[	8.98E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.23E-07	=	[	8.18E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	9.93E-07	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.61E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.82E-03	=	[	2.39E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	5.66E-07	=	[	7.43E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.94E-05	=	[	3.86E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	2.32E-09	=	[	3.04E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	8.57E-07	=	[	1.13E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	5.45E-07	=	[	7.15E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	2.33E-07	=	[	3.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	6.23E-09	=	[	8.18E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.76E-06	=	[	3.62E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Tin	4.85E-07	=	[	6.36E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	5.45E-08	=	[	7.15E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	5.31E-06	=	[	6.97E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	2.92E-06	=	[	3.83E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
2-Butanone	1.89E-10	=	[	2.48E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Bis(2-ethylhexyl) phthalate	3.07E-07	=	[	4.03E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	4.51E-09	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Hexane	2.74E-09	=	[	3.59E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Methylene chloride	1.52E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
o-Xylene	9.75E-12	=	[	1.28E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Styrene	4.98E-11	=	[	6.54E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Toluene	7.45E-11	=	[	9.78E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Xylenes (total)	3.53E-11	=	[	4.63E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
beta-BHC	1.92E-09	=	[	2.52E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Gamma-BHC (Lindane)	3.89E-10	=	[	5.10E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Aroclor-1260	1.57E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation Units	CDIingestion = mg/kg-day		[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]

NONCARCINOGENIC EFFECTS

Aluminum	1.93E-03	=	[	6.76E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	7.06E-08	=	[	2.47E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	9.96E-07	=	[	3.49E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.69E-05	=	[	9.41E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	8.51E-08	=	[	2.98E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	3.33E-08	=	[	1.17E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	2.56E-06	=	[	8.98E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.34E-06	=	[	8.18E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.72E-06	=	[	1.30E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	6.03E-07	=	[	2.11E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.84E-03	=	[	2.39E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.12E-06	=	[	7.43E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.10E-04	=	[	3.86E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	8.69E-09	=	[	3.04E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.22E-06	=	[	1.13E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	2.04E-06	=	[	7.15E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	8.74E-07	=	[	3.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	2.34E-08	=	[	8.18E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	1.03E-05	=	[	3.62E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Tin	1.82E-06	=	[	6.36E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	2.04E-07	=	[	7.15E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.99E-05	=	[	6.97E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.10E-05	=	[	3.83E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
2-Butanone	7.10E-10	=	[	2.48E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Bis(2-ethylhexyl) phthalate	1.15E-06	=	[	4.03E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	1.69E-08	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Hexane	1.03E-08	=	[	3.59E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Methylene chloride	5.71E-10	=	[	2.00E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
o-Xylene	3.66E-11	=	[	1.28E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Styrene	1.87E-10	=	[	6.54E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Toluene	2.79E-10	=	[	9.78E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Xylenes (total)	1.32E-10	=	[	4.63E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
beta-BHC	7.21E-09	=	[	2.52E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Gamma-BHC (Lindane)	1.46E-09	=	[	5.10E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Aroclor-1260	5.89E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.06E-08	=	[	9.3E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.87E-13	=	[	3.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.46E-12	=	[	4.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.47E-10	=	[	1.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	4.67E-13	=	[	4.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.82E-13	=	[	1.6E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.41E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.28E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.04E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.31E-12	=	[	2.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.75E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.16E-11	=	[	1.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.05E-10	=	[	5.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	4.76E-14	=	[	4.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.76E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.12E-11	=	[	9.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	4.79E-12	=	[	4.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.28E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.66E-11	=	[	5.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	9.96E-12	=	[	8.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.12E-12	=	[	9.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.09E-10	=	[	9.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	6.00E-11	=	[	5.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
2-Butanone	3.89E-15	=	[	3.4E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	6.31E-12	=	[	5.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	9.27E-14	=	[	8.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Hexane	5.62E-14	=	[	4.9E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Methylene chloride	3.13E-15	=	[	2.7E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
o-Xylene	2.00E-16	=	[	1.8E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	1.02E-15	=	[	9.0E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	1.53E-15	=	[	1.3E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Xylenes (total)	7.25E-16	=	[	6.3E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	3.95E-14	=	[	3.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Gamma-BHC (Lindane)	7.98E-15	=	[	7.0E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1260	3.23E-14	=	[	2.8E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	2.65E-08	=	[	9.3E-05	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	9.67E-13	=	[	3.4E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	1.37E-11	=	[	4.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.68E-10	=	[	1.3E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	1.17E-12	=	[	4.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	4.56E-13	=	[	1.6E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	3.51E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.20E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	5.10E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	8.27E-12	=	[	2.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.37E-08	=	[	3.3E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	2.91E-11	=	[	1.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.51E-09	=	[	5.3E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	1.19E-13	=	[	4.2E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	4.40E-11	=	[	1.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	2.80E-11	=	[	9.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	1.20E-11	=	[	4.2E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	3.20E-13	=	[	1.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.42E-10	=	[	5.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Tin	2.49E-11	=	[	8.7E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.80E-12	=	[	9.8E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.73E-10	=	[	9.6E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.50E-10	=	[	5.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
2-Butanone	9.73E-15	=	[	3.4E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	1.58E-11	=	[	5.5E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	2.32E-13	=	[	8.1E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Hexane	1.41E-13	=	[	4.9E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Methylene chloride	7.83E-15	=	[	2.7E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
o-Xylene	5.01E-16	=	[	1.8E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Styrene	2.56E-15	=	[	9.0E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Toluene	3.83E-15	=	[	1.3E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Xylenes (total)	1.81E-15	=	[	6.3E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
beta-BHC	9.88E-14	=	[	3.5E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Gamma-BHC (Lindane)	2.00E-14	=	[	7.0E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Aroclor-1260	8.06E-14	=	[	2.8E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method C

Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.15E-04	x	0.00E+00	=	0.00E+00	1.93E-03	/	1.00E+00	=	1.93E-03
Antimony	1.88E-08	x	0.00E+00	=	0.00E+00	7.06E-08	/	4.00E-04	=	1.77E-04
Arsenic	2.66E-07	x	1.50E+00	=	3.99E-07	9.96E-07	/	3.00E-04	=	3.32E-03
Barium	7.17E-06	x	0.00E+00	=	0.00E+00	2.69E-05	/	2.00E-01	=	1.34E-04
Beryllium	2.27E-08	x	0.00E+00	=	0.00E+00	8.51E-08	/	2.00E-03	=	4.26E-05
Cadmium	8.88E-09	x	0.00E+00	=	0.00E+00	3.33E-08	/	1.00E-03	=	3.33E-05
Chromium	6.84E-07	x	0.00E+00	=	0.00E+00	2.56E-06	/	3.00E-03	=	8.55E-04
Cobalt	6.23E-07	x	0.00E+00	=	0.00E+00	2.34E-06	/	3.00E-04	=	7.79E-03
Copper	9.93E-07	x	0.00E+00	=	0.00E+00	3.72E-06	/	4.00E-02	=	9.31E-05
Fluoride	1.61E-07	x	0.00E+00	=	0.00E+00	6.03E-07	/	4.00E-02	=	1.51E-05
Iron	1.82E-03	x	0.00E+00	=	0.00E+00	6.84E-03	/	7.00E-01	=	9.77E-03
Lithium	5.66E-07	x	0.00E+00	=	0.00E+00	2.12E-06	/	2.00E-03	=	1.06E-03
Manganese	2.94E-05	x	0.00E+00	=	0.00E+00	1.10E-04	/	1.40E-01	=	7.88E-04
Mercury	2.32E-09	x	0.00E+00	=	0.00E+00	8.69E-09	/	0.00E+00	=	NA
Nickel	8.57E-07	x	0.00E+00	=	0.00E+00	3.22E-06	/	2.00E-02	=	1.61E-04
Nitrate	5.45E-07	x	0.00E+00	=	0.00E+00	2.04E-06	/	7.10E+00	=	2.88E-07
Nitrite	2.33E-07	x	0.00E+00	=	0.00E+00	8.74E-07	/	3.00E-01	=	2.91E-06
Silver	6.23E-09	x	0.00E+00	=	0.00E+00	2.34E-08	/	5.00E-03	=	4.67E-06
Strontium	2.76E-06	x	0.00E+00	=	0.00E+00	1.03E-05	/	6.00E-01	=	1.72E-05
Tin	4.85E-07	x	0.00E+00	=	0.00E+00	1.82E-06	/	6.00E-01	=	3.03E-06
Total Uranium	5.45E-08	x	0.00E+00	=	0.00E+00	2.04E-07	/	3.00E-03	=	6.81E-05
Vanadium	5.31E-06	x	0.00E+00	=	0.00E+00	1.99E-05	/	5.00E-03	=	3.99E-03
Zinc	2.92E-06	x	0.00E+00	=	0.00E+00	1.10E-05	/	3.00E-01	=	3.65E-05
2-Butanone	1.89E-10	x	0.00E+00	=	0.00E+00	7.10E-10	/	6.00E-01	=	1.18E-09
Bis(2-ethylhexyl) phthalate	3.07E-07	x	1.40E-02	=	4.30E-09	1.15E-06	/	2.00E-02	=	5.76E-05
Butylbenzylphthalate	4.51E-09	x	1.90E-03	=	8.57E-12	1.69E-08	/	2.00E-01	=	8.46E-08
Hexane	2.74E-09	x	0.00E+00	=	0.00E+00	1.03E-08	/	6.00E-02	=	1.71E-07
Methylene chloride	1.52E-10	x	2.00E-03	=	3.05E-13	5.71E-10	/	6.00E-03	=	9.52E-08
o-Xylene	9.75E-12	x	0.00E+00	=	0.00E+00	3.66E-11	/	2.00E-01	=	1.83E-10
Styrene	4.98E-11	x	0.00E+00	=	0.00E+00	1.87E-10	/	2.00E-01	=	9.34E-10
Toluene	7.45E-11	x	0.00E+00	=	0.00E+00	2.79E-10	/	8.00E-02	=	3.49E-09
Xylenes (total)	3.53E-11	x	0.00E+00	=	0.00E+00	1.32E-10	/	2.00E-01	=	6.61E-10
beta-BHC	1.92E-09	x	1.80E+00	=	3.46E-09	7.21E-09	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	3.89E-10	x	1.10E+00	=	4.27E-10	1.46E-09	/	3.00E-04	=	4.86E-06
Aroclor-1260	1.57E-09	x	2.00E+00	=	3.14E-09	5.89E-09	/	0.00E+00	=	NA
			Pathway total	=	4.10E-07			Pathway total	=	3.04E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.06E-08	x	0.00E+00	=	0.00E+00	2.65E-08	/	1.43E-03	=	1.85E-05
Antimony	3.87E-13	x	0.00E+00	=	0.00E+00	9.67E-13	/	0.00E+00	=	NA
Arsenic	5.46E-12	x	1.51E+01	=	8.22E-11	1.37E-11	/	4.29E-06	=	3.19E-06
Barium	1.47E-10	x	0.00E+00	=	0.00E+00	3.68E-10	/	1.43E-04	=	2.58E-06
Beryllium	4.67E-13	x	8.40E+00	=	3.92E-12	1.17E-12	/	5.71E-06	=	2.04E-07
Cadmium	1.82E-13	x	6.30E+00	=	1.15E-12	4.56E-13	/	2.86E-06	=	1.60E-07
Chromium	1.41E-11	x	0.00E+00	=	0.00E+00	3.51E-11	/	0.00E+00	=	NA
Cobalt	1.28E-11	x	3.15E+01	=	4.04E-10	3.20E-11	/	1.71E-06	=	1.87E-05
Copper	2.04E-11	x	0.00E+00	=	0.00E+00	5.10E-11	/	0.00E+00	=	NA
Fluoride	3.31E-12	x	0.00E+00	=	0.00E+00	8.27E-12	/	3.71E-03	=	2.23E-09
Iron	3.75E-08	x	0.00E+00	=	0.00E+00	9.37E-08	/	0.00E+00	=	NA
Lithium	1.16E-11	x	0.00E+00	=	0.00E+00	2.91E-11	/	0.00E+00	=	NA
Manganese	6.05E-10	x	0.00E+00	=	0.00E+00	1.51E-09	/	1.43E-05	=	1.06E-04
Mercury	4.76E-14	x	0.00E+00	=	0.00E+00	1.19E-13	/	8.57E-05	=	1.39E-09
Nickel	1.76E-11	x	9.10E-01	=	1.60E-11	4.40E-11	/	2.57E-05	=	1.71E-06
Nitrate	1.12E-11	x	0.00E+00	=	0.00E+00	2.80E-11	/	0.00E+00	=	NA
Nitrite	4.79E-12	x	0.00E+00	=	0.00E+00	1.20E-11	/	0.00E+00	=	NA
Silver	1.28E-13	x	0.00E+00	=	0.00E+00	3.20E-13	/	0.00E+00	=	NA
Strontium	5.66E-11	x	0.00E+00	=	0.00E+00	1.42E-10	/	0.00E+00	=	NA
Tin	9.96E-12	x	0.00E+00	=	0.00E+00	2.49E-11	/	0.00E+00	=	NA
Total Uranium	1.12E-12	x	0.00E+00	=	0.00E+00	2.80E-12	/	1.14E-05	=	2.45E-07
Vanadium	1.09E-10	x	0.00E+00	=	0.00E+00	2.73E-10	/	2.86E-05	=	9.55E-06
Zinc	6.00E-11	x	0.00E+00	=	0.00E+00	1.50E-10	/	0.00E+00	=	NA
2-Butanone	3.89E-15	x	0.00E+00	=	0.00E+00	9.73E-15	/	1.43E+00	=	6.81E-15
Bis(2-ethylhexyl) phthalate	6.31E-12	x	8.40E-03	=	5.30E-14	1.58E-11	/	0.00E+00	=	NA
Butylbenzylphthalate	9.27E-14	x	0.00E+00	=	0.00E+00	2.32E-13	/	0.00E+00	=	NA
Hexane	5.62E-14	x	0.00E+00	=	0.00E+00	1.41E-13	/	2.00E-01	=	7.03E-13
Methylene chloride	3.13E-15	x	3.50E-05	=	1.10E-19	7.83E-15	/	1.71E-01	=	4.57E-14
o-Xylene	2.00E-16	x	0.00E+00	=	0.00E+00	5.01E-16	/	2.86E-02	=	1.75E-14
Styrene	1.02E-15	x	0.00E+00	=	0.00E+00	2.56E-15	/	2.86E-01	=	8.96E-15
Toluene	1.53E-15	x	0.00E+00	=	0.00E+00	3.83E-15	/	1.43E+00	=	2.68E-15
Xylenes (total)	7.25E-16	x	0.00E+00	=	0.00E+00	1.81E-15	/	2.86E-02	=	6.34E-14
beta-BHC	3.95E-14	x	1.86E+00	=	7.33E-14	9.88E-14	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	7.98E-15	x	1.09E+00	=	8.66E-15	2.00E-14	/	0.00E+00	=	NA
Aroclor-1260	3.23E-14	x	2.00E+00	=	6.43E-14	8.06E-14	/	0.00E+00	=	NA
			Pathway total =		5.07E-10			Pathway total =		1.61E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.8E-04
Arsenic	Sum of all pathways	=	3.99E-07	Sum of all pathways	=	3.3E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-04
Beryllium	Sum of all pathways	=	3.92E-12	Sum of all pathways	=	4.3E-05
Cadmium	Sum of all pathways	=	1.15E-12	Sum of all pathways	=	3.3E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.5E-04
Cobalt	Sum of all pathways	=	4.04E-10	Sum of all pathways	=	7.8E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.3E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.8E-03
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.9E-04
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-09
Nickel	Sum of all pathways	=	1.60E-11	Sum of all pathways	=	1.6E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.9E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.9E-06
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.7E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-05
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-06
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.8E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.0E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.7E-05
2-Butanone	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	4.30E-09	Sum of all pathways	=	5.8E-05
Butylbenzylphthalate	Sum of all pathways	=	8.57E-12	Sum of all pathways	=	8.5E-08
Hexane	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-07
Methylene chloride	Sum of all pathways	=	3.05E-13	Sum of all pathways	=	9.5E-08
o-Xylene	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.8E-10
Styrene	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.3E-10
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.5E-09
Xylenes (total)	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.6E-10
beta-BHC	Sum of all pathways	=	3.46E-09	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	4.27E-10	Sum of all pathways	=	4.9E-06
Aroclor-1260	Sum of all pathways	=	3.14E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	4.10E-07	All Pathways and Chemicals	=	3.05E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	5.34E-04	=	[	7.01E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	1.95E-08	=	[	2.56E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	3.82E-07	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	6.89E-06	=	[	9.05E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	1.51E-08	=	[	1.99E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	1.05E-08	=	[	1.37E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	1.28E-06	=	[	1.68E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	7.76E-07	=	[	1.02E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	9.29E-07	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.26E-07	=	[	1.66E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.99E-03	=	[	2.61E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	5.76E-07	=	[	7.56E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	3.11E-05	=	[	4.08E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Molybdenum	1.52E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	9.97E-07	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	2.47E-06	=	[	3.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	9.90E-08	=	[	1.30E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Selenium	7.49E-08	=	[	9.83E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	4.99E-09	=	[	6.55E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.54E-06	=	[	3.34E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	4.16E-08	=	[	5.45E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	5.04E-06	=	[	6.61E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.41E-06	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	1.52E-08	=	[	2.00E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Di-n-butylphthalate	4.34E-08	=	[	5.70E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Styrene	3.00E-11	=	[	3.94E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Toluene	4.71E-11	=	[	6.18E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	2.00E-03	=	[	7.01E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	7.31E-08	=	[	2.56E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	1.43E-06	=	[	5.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.58E-05	=	[	9.05E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	5.68E-08	=	[	1.99E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	3.93E-08	=	[	1.37E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	4.80E-06	=	[	1.68E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.91E-06	=	[	1.02E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.48E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	4.73E-07	=	[	1.66E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	7.45E-03	=	[	2.61E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.16E-06	=	[	7.56E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.17E-04	=	[	4.08E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Molybdenum	5.71E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.74E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	9.27E-06	=	[	3.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	3.71E-07	=	[	1.30E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Selenium	2.81E-07	=	[	9.83E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	1.87E-08	=	[	6.55E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	9.54E-06	=	[	3.34E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	1.56E-07	=	[	5.45E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.89E-05	=	[	6.61E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.28E-05	=	[	4.48E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	5.71E-08	=	[	2.00E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Di-n-butylphthalate	1.63E-07	=	[	5.70E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Styrene	1.13E-10	=	[	3.94E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Toluene	1.77E-10	=	[	6.18E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.10E-08	=	[	9.6E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.01E-13	=	[	3.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	7.86E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.42E-10	=	[	1.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	3.11E-13	=	[	2.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	2.15E-13	=	[	1.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.63E-11	=	[	2.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.59E-11	=	[	1.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	1.91E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.59E-12	=	[	2.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	4.08E-08	=	[	3.6E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.18E-11	=	[	1.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.39E-10	=	[	5.6E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.13E-12	=	[	2.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.05E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	5.08E-11	=	[	4.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	2.03E-12	=	[	1.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	1.54E-12	=	[	1.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.03E-13	=	[	9.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.23E-11	=	[	4.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	8.54E-13	=	[	7.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.04E-10	=	[	9.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.01E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	3.13E-13	=	[	2.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Di-n-butylphthalate	8.92E-13	=	[	7.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	6.17E-16	=	[	5.4E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	9.68E-16	=	[	8.5E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Industrial Adult Worker

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	2.74E-08	=	[	9.6E-05	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	1.00E-12	=	[	3.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	1.96E-11	=	[	6.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.54E-10	=	[	1.2E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	7.78E-13	=	[	2.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	5.38E-13	=	[	1.9E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	6.57E-11	=	[	2.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.98E-11	=	[	1.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	4.77E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	6.49E-12	=	[	2.3E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	1.02E-07	=	[	3.6E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	2.96E-11	=	[	1.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.60E-09	=	[	5.6E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Molybdenum	7.83E-12	=	[	2.7E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	5.12E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	1.27E-10	=	[	4.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	5.09E-12	=	[	1.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Selenium	3.85E-12	=	[	1.3E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	2.56E-13	=	[	9.0E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.31E-10	=	[	4.6E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.13E-12	=	[	7.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.59E-10	=	[	9.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.75E-10	=	[	6.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	7.83E-13	=	[	2.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Di-n-butylphthalate	2.23E-12	=	[	7.8E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Styrene	1.54E-15	=	[	5.4E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Toluene	2.42E-15	=	[	8.5E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.34E-04	x	0.00E+00	=	0.00E+00	2.00E-03	/	1.00E+00	=	2.00E-03
Antimony	1.95E-08	x	0.00E+00	=	0.00E+00	7.31E-08	/	4.00E-04	=	1.83E-04
Arsenic	3.82E-07	x	1.50E+00	=	5.74E-07	1.43E-06	/	3.00E-04	=	4.78E-03
Barium	6.89E-06	x	0.00E+00	=	0.00E+00	2.58E-05	/	2.00E-01	=	1.29E-04
Beryllium	1.51E-08	x	0.00E+00	=	0.00E+00	5.68E-08	/	2.00E-03	=	2.84E-05
Cadmium	1.05E-08	x	0.00E+00	=	0.00E+00	3.93E-08	/	1.00E-03	=	3.93E-05
Chromium	1.28E-06	x	0.00E+00	=	0.00E+00	4.80E-06	/	3.00E-03	=	1.60E-03
Cobalt	7.76E-07	x	0.00E+00	=	0.00E+00	2.91E-06	/	3.00E-04	=	9.70E-03
Copper	9.29E-07	x	0.00E+00	=	0.00E+00	3.48E-06	/	4.00E-02	=	8.71E-05
Fluoride	1.26E-07	x	0.00E+00	=	0.00E+00	4.73E-07	/	4.00E-02	=	1.18E-05
Iron	1.99E-03	x	0.00E+00	=	0.00E+00	7.45E-03	/	7.00E-01	=	1.06E-02
Lithium	5.76E-07	x	0.00E+00	=	0.00E+00	2.16E-06	/	2.00E-03	=	1.08E-03
Manganese	3.11E-05	x	0.00E+00	=	0.00E+00	1.17E-04	/	1.40E-01	=	8.33E-04
Molybdenum	1.52E-07	x	0.00E+00	=	0.00E+00	5.71E-07	/	5.00E-03	=	1.14E-04
Nickel	9.97E-07	x	0.00E+00	=	0.00E+00	3.74E-06	/	2.00E-02	=	1.87E-04
Nitrate	2.47E-06	x	0.00E+00	=	0.00E+00	9.27E-06	/	7.10E+00	=	1.31E-06
Nitrite	9.90E-08	x	0.00E+00	=	0.00E+00	3.71E-07	/	3.00E-01	=	1.24E-06
Selenium	7.49E-08	x	0.00E+00	=	0.00E+00	2.81E-07	/	5.00E-03	=	5.61E-05
Silver	4.99E-09	x	0.00E+00	=	0.00E+00	1.87E-08	/	5.00E-03	=	3.74E-06
Strontium	2.54E-06	x	0.00E+00	=	0.00E+00	9.54E-06	/	6.00E-01	=	1.59E-05
Total Uranium	4.16E-08	x	0.00E+00	=	0.00E+00	1.56E-07	/	3.00E-03	=	5.19E-05
Vanadium	5.04E-06	x	0.00E+00	=	0.00E+00	1.89E-05	/	5.00E-03	=	3.78E-03
Zinc	3.41E-06	x	0.00E+00	=	0.00E+00	1.28E-05	/	3.00E-01	=	4.27E-05
Butylbenzylphthalate	1.52E-08	x	1.90E-03	=	2.90E-11	5.71E-08	/	2.00E-01	=	2.86E-07
Di-n-butylphthalate	4.34E-08	x	0.00E+00	=	0.00E+00	1.63E-07	/	1.00E-01	=	1.63E-06
Styrene	3.00E-11	x	0.00E+00	=	0.00E+00	1.13E-10	/	2.00E-01	=	5.63E-10
Toluene	4.71E-11	x	0.00E+00	=	0.00E+00	1.77E-10	/	8.00E-02	=	2.21E-09
			Pathway total	=	5.74E-07			Pathway total	=	3.54E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.10E-08	x	0.00E+00	=	0.00E+00	2.74E-08	/	1.43E-03	=	1.92E-05
Antimony	4.01E-13	x	0.00E+00	=	0.00E+00	1.00E-12	/	0.00E+00	=	NA
Arsenic	7.86E-12	x	1.51E+01	=	1.18E-10	1.96E-11	/	4.29E-06	=	4.58E-06
Barium	1.42E-10	x	0.00E+00	=	0.00E+00	3.54E-10	/	1.43E-04	=	2.48E-06
Beryllium	3.11E-13	x	8.40E+00	=	2.61E-12	7.78E-13	/	5.71E-06	=	1.36E-07
Cadmium	2.15E-13	x	6.30E+00	=	1.36E-12	5.38E-13	/	2.86E-06	=	1.88E-07
Chromium	2.63E-11	x	0.00E+00	=	0.00E+00	6.57E-11	/	0.00E+00	=	NA
Cobalt	1.59E-11	x	3.15E+01	=	5.02E-10	3.98E-11	/	1.71E-06	=	2.32E-05
Copper	1.91E-11	x	0.00E+00	=	0.00E+00	4.77E-11	/	0.00E+00	=	NA
Fluoride	2.59E-12	x	0.00E+00	=	0.00E+00	6.49E-12	/	3.71E-03	=	1.75E-09
Iron	4.08E-08	x	0.00E+00	=	0.00E+00	1.02E-07	/	0.00E+00	=	NA
Lithium	1.18E-11	x	0.00E+00	=	0.00E+00	2.96E-11	/	0.00E+00	=	NA
Manganese	6.39E-10	x	0.00E+00	=	0.00E+00	1.60E-09	/	1.43E-05	=	1.12E-04
Molybdenum	3.13E-12	x	0.00E+00	=	0.00E+00	7.83E-12	/	0.00E+00	=	NA
Nickel	2.05E-11	x	9.10E-01	=	1.86E-11	5.12E-11	/	2.57E-05	=	1.99E-06
Nitrate	5.08E-11	x	0.00E+00	=	0.00E+00	1.27E-10	/	0.00E+00	=	NA
Nitrite	2.03E-12	x	0.00E+00	=	0.00E+00	5.09E-12	/	0.00E+00	=	NA
Selenium	1.54E-12	x	0.00E+00	=	0.00E+00	3.85E-12	/	5.71E-03	=	6.73E-10
Silver	1.03E-13	x	0.00E+00	=	0.00E+00	2.56E-13	/	0.00E+00	=	NA
Strontium	5.23E-11	x	0.00E+00	=	0.00E+00	1.31E-10	/	0.00E+00	=	NA
Total Uranium	8.54E-13	x	0.00E+00	=	0.00E+00	2.13E-12	/	1.14E-05	=	1.87E-07
Vanadium	1.04E-10	x	0.00E+00	=	0.00E+00	2.59E-10	/	2.86E-05	=	9.06E-06
Zinc	7.01E-11	x	0.00E+00	=	0.00E+00	1.75E-10	/	0.00E+00	=	NA
Butylbenzylphthalate	3.13E-13	x	0.00E+00	=	0.00E+00	7.83E-13	/	0.00E+00	=	NA
Di-n-butylphthalate	8.92E-13	x	0.00E+00	=	0.00E+00	2.23E-12	/	0.00E+00	=	NA
Styrene	6.17E-16	x	0.00E+00	=	0.00E+00	1.54E-15	/	2.86E-01	=	5.40E-15
Toluene	9.68E-16	x	0.00E+00	=	0.00E+00	2.42E-15	/	1.43E+00	=	1.69E-15
			Pathway total =		6.43E-10			Pathway total =		1.73E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.8E-04
Arsenic	Sum of all pathways	=	5.74E-07	Sum of all pathways	=	4.8E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04
Beryllium	Sum of all pathways	=	2.61E-12	Sum of all pathways	=	2.9E-05
Cadmium	Sum of all pathways	=	1.36E-12	Sum of all pathways	=	3.9E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-03
Cobalt	Sum of all pathways	=	5.02E-10	Sum of all pathways	=	9.7E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.7E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-02
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.4E-04
Molybdenum	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-04
Nickel	Sum of all pathways	=	1.86E-11	Sum of all pathways	=	1.9E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-06
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-06
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.6E-05
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.7E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-05
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.8E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.3E-05
Butylbenzylphthalate	Sum of all pathways	=	2.90E-11	Sum of all pathways	=	2.9E-07
Di-n-butylphthalate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-06
Styrene	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.6E-10
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.2E-09

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.74E-07	All Pathways and Chemicals	=	3.55E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
CARCINOGENIC EFFECTS																					
Aluminum	5.90E-04	=	[	7.74E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	1.65E-07	=	[	2.16E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	6.01E-07	=	[	7.89E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	1.86E-05	=	[	2.44E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	2.50E-08	=	[	3.28E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Boron	3.34E-06	=	[	4.39E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	8.61E-09	=	[	1.13E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	8.84E-07	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.30E-07	=	[	8.27E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	1.05E-06	=	[	1.38E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.17E-07	=	[	1.53E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.84E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	6.61E-07	=	[	8.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.92E-05	=	[	3.83E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	1.23E-09	=	[	1.62E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	1.04E-06	=	[	1.37E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	7.03E-07	=	[	9.23E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	1.90E-07	=	[	2.50E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	4.75E-09	=	[	6.24E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	9.52E-06	=	[	1.25E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Tin	2.74E-07	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	4.96E-08	=	[	6.50E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	4.14E-06	=	[	5.43E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.98E-06	=	[	5.23E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Bis(2-ethylhexyl) phthalate	1.58E-07	=	[	2.07E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	5.93E-09	=	[	7.78E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	2.21E-03	=	[	7.74E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	6.17E-07	=	[	2.16E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	2.25E-06	=	[	7.89E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	6.97E-05	=	[	2.44E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	9.37E-08	=	[	3.28E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Boron	1.25E-05	=	[	4.39E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	3.23E-08	=	[	1.13E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	3.31E-06	=	[	1.16E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.36E-06	=	[	8.27E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.94E-06	=	[	1.38E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	4.37E-07	=	[	1.53E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.89E-03	=	[	2.41E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.48E-06	=	[	8.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.09E-04	=	[	3.83E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	4.63E-09	=	[	1.62E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.91E-06	=	[	1.37E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	2.64E-06	=	[	9.23E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	7.14E-07	=	[	2.50E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	1.78E-08	=	[	6.24E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	3.57E-05	=	[	1.25E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Tin	1.03E-06	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	1.86E-07	=	[	6.50E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.55E-05	=	[	5.43E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.49E-05	=	[	5.23E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Bis(2-ethylhexyl) phthalate	5.91E-07	=	[	2.07E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	2.22E-08	=	[	7.78E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.21E-08	=	[	1.1E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.38E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	1.24E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	3.82E-10	=	[	3.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	5.14E-13	=	[	4.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	6.87E-11	=	[	6.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.77E-13	=	[	1.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.82E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.29E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.16E-11	=	[	1.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.40E-12	=	[	2.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.77E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.36E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.00E-10	=	[	5.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	2.54E-14	=	[	2.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.14E-11	=	[	1.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.45E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.91E-12	=	[	3.4E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	9.77E-14	=	[	8.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	1.96E-10	=	[	1.7E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	5.64E-12	=	[	4.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.02E-12	=	[	8.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	8.50E-11	=	[	7.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	8.19E-11	=	[	7.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	3.24E-12	=	[	2.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.22E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	3.03E-08	=	[	1.1E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	8.45E-12	=	[	3.0E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	3.09E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	9.55E-10	=	[	3.3E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	1.28E-12	=	[	4.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Boron	1.72E-10	=	[	6.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	4.42E-13	=	[	1.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	4.54E-11	=	[	1.6E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.24E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	5.40E-11	=	[	1.9E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	5.99E-12	=	[	2.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.43E-08	=	[	3.3E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	3.40E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.50E-09	=	[	5.2E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	6.34E-14	=	[	2.2E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	5.36E-11	=	[	1.9E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	3.61E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	9.78E-12	=	[	3.4E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	2.44E-13	=	[	8.5E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	4.89E-10	=	[	1.7E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Tin	1.41E-11	=	[	4.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.55E-12	=	[	8.9E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.13E-10	=	[	7.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	2.05E-10	=	[	7.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	8.10E-12	=	[	2.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	3.05E-13	=	[	1.1E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.90E-04	x	0.00E+00	=	0.00E+00	2.21E-03	/	1.00E+00	=	2.21E-03
Antimony	1.65E-07	x	0.00E+00	=	0.00E+00	6.17E-07	/	4.00E-04	=	1.54E-03
Arsenic	6.01E-07	x	1.50E+00	=	9.02E-07	2.25E-06	/	3.00E-04	=	7.51E-03
Barium	1.86E-05	x	0.00E+00	=	0.00E+00	6.97E-05	/	2.00E-01	=	3.49E-04
Beryllium	2.50E-08	x	0.00E+00	=	0.00E+00	9.37E-08	/	2.00E-03	=	4.69E-05
Boron	3.34E-06	x	0.00E+00	=	0.00E+00	1.25E-05	/	2.00E-01	=	6.27E-05
Cadmium	8.61E-09	x	0.00E+00	=	0.00E+00	3.23E-08	/	1.00E-03	=	3.23E-05
Chromium	8.84E-07	x	0.00E+00	=	0.00E+00	3.31E-06	/	3.00E-03	=	1.10E-03
Cobalt	6.30E-07	x	0.00E+00	=	0.00E+00	2.36E-06	/	3.00E-04	=	7.88E-03
Copper	1.05E-06	x	0.00E+00	=	0.00E+00	3.94E-06	/	4.00E-02	=	9.86E-05
Fluoride	1.17E-07	x	0.00E+00	=	0.00E+00	4.37E-07	/	4.00E-02	=	1.09E-05
Iron	1.84E-03	x	0.00E+00	=	0.00E+00	6.89E-03	/	7.00E-01	=	9.84E-03
Lithium	6.61E-07	x	0.00E+00	=	0.00E+00	2.48E-06	/	2.00E-03	=	1.24E-03
Manganese	2.92E-05	x	0.00E+00	=	0.00E+00	1.09E-04	/	1.40E-01	=	7.82E-04
Mercury	1.23E-09	x	0.00E+00	=	0.00E+00	4.63E-09	/	0.00E+00	=	**NA**
Nickel	1.04E-06	x	0.00E+00	=	0.00E+00	3.91E-06	/	2.00E-02	=	1.96E-04
Nitrate	7.03E-07	x	0.00E+00	=	0.00E+00	2.64E-06	/	7.10E+00	=	3.71E-07
Nitrite	1.90E-07	x	0.00E+00	=	0.00E+00	7.14E-07	/	3.00E-01	=	2.38E-06
Silver	4.75E-09	x	0.00E+00	=	0.00E+00	1.78E-08	/	5.00E-03	=	3.57E-06
Strontium	9.52E-06	x	0.00E+00	=	0.00E+00	3.57E-05	/	6.00E-01	=	5.95E-05
Tin	2.74E-07	x	0.00E+00	=	0.00E+00	1.03E-06	/	6.00E-01	=	1.71E-06
Total Uranium	4.96E-08	x	0.00E+00	=	0.00E+00	1.86E-07	/	3.00E-03	=	6.19E-05
Vanadium	4.14E-06	x	0.00E+00	=	0.00E+00	1.55E-05	/	5.00E-03	=	3.10E-03
Zinc	3.98E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	3.00E-01	=	4.98E-05
Bis(2-ethylhexyl) phthalate	1.58E-07	x	1.40E-02	=	2.21E-09	5.91E-07	/	2.00E-02	=	2.96E-05
Butylbenzylphthalate	5.93E-09	x	1.90E-03	=	1.13E-11	2.22E-08	/	2.00E-01	=	1.11E-07
			Pathway total	=	9.04E-07			Pathway total	=	3.62E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.21E-08	x	0.00E+00	=	0.00E+00	3.03E-08	/	1.43E-03	=	2.12E-05
Antimony	3.38E-12	x	0.00E+00	=	0.00E+00	8.45E-12	/	0.00E+00	=	NA
Arsenic	1.24E-11	x	1.51E+01	=	1.86E-10	3.09E-11	/	4.29E-06	=	7.21E-06
Barium	3.82E-10	x	0.00E+00	=	0.00E+00	9.55E-10	/	1.43E-04	=	6.68E-06
Beryllium	5.14E-13	x	8.40E+00	=	4.31E-12	1.28E-12	/	5.71E-06	=	2.25E-07
Boron	6.87E-11	x	0.00E+00	=	0.00E+00	1.72E-10	/	5.71E-03	=	3.01E-08
Cadmium	1.77E-13	x	6.30E+00	=	1.11E-12	4.42E-13	/	2.86E-06	=	1.55E-07
Chromium	1.82E-11	x	0.00E+00	=	0.00E+00	4.54E-11	/	0.00E+00	=	NA
Cobalt	1.29E-11	x	3.15E+01	=	4.08E-10	3.24E-11	/	1.71E-06	=	1.89E-05
Copper	2.16E-11	x	0.00E+00	=	0.00E+00	5.40E-11	/	0.00E+00	=	NA
Fluoride	2.40E-12	x	0.00E+00	=	0.00E+00	5.99E-12	/	3.71E-03	=	1.61E-09
Iron	3.77E-08	x	0.00E+00	=	0.00E+00	9.43E-08	/	0.00E+00	=	NA
Lithium	1.36E-11	x	0.00E+00	=	0.00E+00	3.40E-11	/	0.00E+00	=	NA
Manganese	6.00E-10	x	0.00E+00	=	0.00E+00	1.50E-09	/	1.43E-05	=	1.05E-04
Mercury	2.54E-14	x	0.00E+00	=	0.00E+00	6.34E-14	/	8.57E-05	=	7.40E-10
Nickel	2.14E-11	x	9.10E-01	=	1.95E-11	5.36E-11	/	2.57E-05	=	2.09E-06
Nitrate	1.45E-11	x	0.00E+00	=	0.00E+00	3.61E-11	/	0.00E+00	=	NA
Nitrite	3.91E-12	x	0.00E+00	=	0.00E+00	9.78E-12	/	0.00E+00	=	NA
Silver	9.77E-14	x	0.00E+00	=	0.00E+00	2.44E-13	/	0.00E+00	=	NA
Strontium	1.96E-10	x	0.00E+00	=	0.00E+00	4.89E-10	/	0.00E+00	=	NA
Tin	5.64E-12	x	0.00E+00	=	0.00E+00	1.41E-11	/	0.00E+00	=	NA
Total Uranium	1.02E-12	x	0.00E+00	=	0.00E+00	2.55E-12	/	1.14E-05	=	2.23E-07
Vanadium	8.50E-11	x	0.00E+00	=	0.00E+00	2.13E-10	/	2.86E-05	=	7.44E-06
Zinc	8.19E-11	x	0.00E+00	=	0.00E+00	2.05E-10	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	3.24E-12	x	8.40E-03	=	2.72E-14	8.10E-12	/	0.00E+00	=	NA
Butylbenzylphthalate	1.22E-13	x	0.00E+00	=	0.00E+00	3.05E-13	/	0.00E+00	=	NA
			Pathway total =		6.19E-10			Pathway total =		1.69E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.2E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-03
Arsenic	Sum of all pathways	=	9.02E-07	Sum of all pathways	=	7.5E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.6E-04
Beryllium	Sum of all pathways	=	4.31E-12	Sum of all pathways	=	4.7E-05
Boron	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.3E-05
Cadmium	Sum of all pathways	=	1.11E-12	Sum of all pathways	=	3.2E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-03
Cobalt	Sum of all pathways	=	4.08E-10	Sum of all pathways	=	7.9E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.9E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.8E-03
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.9E-04
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.4E-10
Nickel	Sum of all pathways	=	1.95E-11	Sum of all pathways	=	2.0E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.7E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.4E-06
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.6E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.0E-05
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-06
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.2E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.1E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.0E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.21E-09	Sum of all pathways	=	3.0E-05
Butylbenzylphthalate	Sum of all pathways	=	1.13E-11	Sum of all pathways	=	1.1E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	9.05E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.64E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	4.87E-04	=	[	6.40E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	2.05E-08	=	[	2.69E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	2.74E-07	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	6.36E-06	=	[	8.34E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	1.25E-08	=	[	1.64E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	7.29E-09	=	[	9.56E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	7.37E-07	=	[	9.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.29E-07	=	[	8.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	9.28E-07	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	9.63E-08	=	[	1.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.60E-03	=	[	2.11E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	5.39E-07	=	[	7.07E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.71E-05	=	[	3.56E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	1.30E-09	=	[	1.71E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Molybdenum	1.87E-07	=	[	2.45E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	1.00E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	5.85E-07	=	[	7.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	2.36E-07	=	[	3.10E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Selenium	1.03E-07	=	[	1.35E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	7.16E-09	=	[	9.40E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.36E-06	=	[	3.10E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	5.24E-08	=	[	6.88E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	4.50E-06	=	[	5.91E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	2.90E-06	=	[	3.80E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Acetone	3.52E-09	=	[	4.62E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
1-Butanol	1.69E-09	=	[	2.22E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Bis(2-ethylhexyl) phthalate	1.40E-07	=	[	1.84E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Butylbenzylphthalate	4.51E-09	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Hexane	4.61E-09	=	[	6.05E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
beta-BHC	1.73E-09	=	[	2.27E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	1.83E-03	=	[	6.40E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	7.70E-08	=	[	2.69E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	1.03E-06	=	[	3.60E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.38E-05	=	[	8.34E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	4.68E-08	=	[	1.64E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	2.73E-08	=	[	9.56E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	2.77E-06	=	[	9.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.36E-06	=	[	8.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.48E-06	=	[	1.22E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	3.61E-07	=	[	1.26E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.02E-03	=	[	2.11E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.02E-06	=	[	7.07E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.02E-04	=	[	3.56E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	4.89E-09	=	[	1.71E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Molybdenum	7.00E-07	=	[	2.45E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.75E-06	=	[	1.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	2.20E-06	=	[	7.68E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	8.86E-07	=	[	3.10E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Selenium	3.86E-07	=	[	1.35E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	2.69E-08	=	[	9.40E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	8.86E-06	=	[	3.10E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	1.96E-07	=	[	6.88E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.69E-05	=	[	5.91E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.09E-05	=	[	3.80E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Acetone	1.32E-08	=	[	4.62E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
1-Butanol	6.34E-09	=	[	2.22E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Bis(2-ethylhexyl) phthalate	5.26E-07	=	[	1.84E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Butylbenzylphthalate	1.69E-08	=	[	5.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Hexane	1.73E-08	=	[	6.05E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
beta-BHC	6.47E-09	=	[	2.27E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.00E-08	=	[	8.8E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.22E-13	=	[	3.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.63E-12	=	[	4.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.31E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	2.57E-13	=	[	2.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.50E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.52E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.29E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	1.91E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	1.98E-12	=	[	1.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.30E-08	=	[	2.9E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.11E-11	=	[	9.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.57E-10	=	[	4.9E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	2.68E-14	=	[	2.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.84E-12	=	[	3.4E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.06E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.20E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	4.85E-12	=	[	4.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	2.11E-12	=	[	1.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.47E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	4.85E-11	=	[	4.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.08E-12	=	[	9.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.25E-11	=	[	8.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	5.95E-11	=	[	5.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	7.23E-14	=	[	6.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
1-Butanol	3.48E-14	=	[	3.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	2.88E-12	=	[	2.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	9.27E-14	=	[	8.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Hexane	9.47E-14	=	[	8.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	3.55E-14	=	[	3.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	2.50E-08	=	[	8.8E-05	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	1.05E-12	=	[	3.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	1.41E-11	=	[	4.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.27E-10	=	[	1.1E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	6.41E-13	=	[	2.2E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	3.74E-13	=	[	1.3E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	3.79E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.23E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	4.77E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	4.95E-12	=	[	1.7E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	8.24E-08	=	[	2.9E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	2.77E-11	=	[	9.7E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.39E-09	=	[	4.9E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	6.69E-14	=	[	2.3E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Molybdenum	9.59E-12	=	[	3.4E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	5.14E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	3.01E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	1.21E-11	=	[	4.2E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Selenium	5.28E-12	=	[	1.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	3.68E-13	=	[	1.3E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.21E-10	=	[	4.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.69E-12	=	[	9.4E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.31E-10	=	[	8.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.49E-10	=	[	5.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Acetone	1.81E-13	=	[	6.3E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
1-Butanol	8.69E-14	=	[	3.0E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	7.20E-12	=	[	2.5E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Butylbenzylphthalate	2.32E-13	=	[	8.1E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Hexane	2.37E-13	=	[	8.3E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
beta-BHC	8.86E-14	=	[	3.1E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.87E-04	x	0.00E+00	=	0.00E+00	1.83E-03	/	1.00E+00	=	1.83E-03
Antimony	2.05E-08	x	0.00E+00	=	0.00E+00	7.70E-08	/	4.00E-04	=	1.92E-04
Arsenic	2.74E-07	x	1.50E+00	=	4.11E-07	1.03E-06	/	3.00E-04	=	3.43E-03
Barium	6.36E-06	x	0.00E+00	=	0.00E+00	2.38E-05	/	2.00E-01	=	1.19E-04
Beryllium	1.25E-08	x	0.00E+00	=	0.00E+00	4.68E-08	/	2.00E-03	=	2.34E-05
Cadmium	7.29E-09	x	0.00E+00	=	0.00E+00	2.73E-08	/	1.00E-03	=	2.73E-05
Chromium	7.37E-07	x	0.00E+00	=	0.00E+00	2.77E-06	/	3.00E-03	=	9.22E-04
Cobalt	6.29E-07	x	0.00E+00	=	0.00E+00	2.36E-06	/	3.00E-04	=	7.87E-03
Copper	9.28E-07	x	0.00E+00	=	0.00E+00	3.48E-06	/	4.00E-02	=	8.70E-05
Fluoride	9.63E-08	x	0.00E+00	=	0.00E+00	3.61E-07	/	4.00E-02	=	9.03E-06
Iron	1.60E-03	x	0.00E+00	=	0.00E+00	6.02E-03	/	7.00E-01	=	8.60E-03
Lithium	5.39E-07	x	0.00E+00	=	0.00E+00	2.02E-06	/	2.00E-03	=	1.01E-03
Manganese	2.71E-05	x	0.00E+00	=	0.00E+00	1.02E-04	/	1.40E-01	=	7.26E-04
Mercury	1.30E-09	x	0.00E+00	=	0.00E+00	4.89E-09	/	0.00E+00	=	NA
Molybdenum	1.87E-07	x	0.00E+00	=	0.00E+00	7.00E-07	/	5.00E-03	=	1.40E-04
Nickel	1.00E-06	x	0.00E+00	=	0.00E+00	3.75E-06	/	2.00E-02	=	1.88E-04
Nitrate	5.85E-07	x	0.00E+00	=	0.00E+00	2.20E-06	/	7.10E+00	=	3.09E-07
Nitrite	2.36E-07	x	0.00E+00	=	0.00E+00	8.86E-07	/	3.00E-01	=	2.95E-06
Selenium	1.03E-07	x	0.00E+00	=	0.00E+00	3.86E-07	/	5.00E-03	=	7.71E-05
Silver	7.16E-09	x	0.00E+00	=	0.00E+00	2.69E-08	/	5.00E-03	=	5.37E-06
Strontium	2.36E-06	x	0.00E+00	=	0.00E+00	8.86E-06	/	6.00E-01	=	1.48E-05
Total Uranium	5.24E-08	x	0.00E+00	=	0.00E+00	1.96E-07	/	3.00E-03	=	6.55E-05
Vanadium	4.50E-06	x	0.00E+00	=	0.00E+00	1.69E-05	/	5.00E-03	=	3.38E-03
Zinc	2.90E-06	x	0.00E+00	=	0.00E+00	1.09E-05	/	3.00E-01	=	3.62E-05
Acetone	3.52E-09	x	0.00E+00	=	0.00E+00	1.32E-08	/	9.00E-01	=	1.47E-08
1-Butanol	1.69E-09	x	0.00E+00	=	0.00E+00	6.34E-09	/	1.00E-01	=	6.34E-08
Bis(2-ethylhexyl) phthalate	1.40E-07	x	1.40E-02	=	1.96E-09	5.26E-07	/	2.00E-02	=	2.63E-05
Butylbenzylphthalate	4.51E-09	x	1.90E-03	=	8.57E-12	1.69E-08	/	2.00E-01	=	8.46E-08
Hexane	4.61E-09	x	0.00E+00	=	0.00E+00	1.73E-08	/	6.00E-02	=	2.88E-07
beta-BHC	1.73E-09	x	1.80E+00	=	3.11E-09	6.47E-09	/	0.00E+00	=	NA
			Pathway total	=	4.16E-07			Pathway total	=	2.88E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.00E-08	x	0.00E+00	=	0.00E+00	2.50E-08	/	1.43E-03	=	1.75E-05
Antimony	4.22E-13	x	0.00E+00	=	0.00E+00	1.05E-12	/	0.00E+00	=	NA
Arsenic	5.63E-12	x	1.51E+01	=	8.48E-11	1.41E-11	/	4.29E-06	=	3.29E-06
Barium	1.31E-10	x	0.00E+00	=	0.00E+00	3.27E-10	/	1.43E-04	=	2.29E-06
Beryllium	2.57E-13	x	8.40E+00	=	2.16E-12	6.41E-13	/	5.71E-06	=	1.12E-07
Cadmium	1.50E-13	x	6.30E+00	=	9.43E-13	3.74E-13	/	2.86E-06	=	1.31E-07
Chromium	1.52E-11	x	0.00E+00	=	0.00E+00	3.79E-11	/	0.00E+00	=	NA
Cobalt	1.29E-11	x	3.15E+01	=	4.07E-10	3.23E-11	/	1.71E-06	=	1.89E-05
Copper	1.91E-11	x	0.00E+00	=	0.00E+00	4.77E-11	/	0.00E+00	=	NA
Fluoride	1.98E-12	x	0.00E+00	=	0.00E+00	4.95E-12	/	3.71E-03	=	1.33E-09
Iron	3.30E-08	x	0.00E+00	=	0.00E+00	8.24E-08	/	0.00E+00	=	NA
Lithium	1.11E-11	x	0.00E+00	=	0.00E+00	2.77E-11	/	0.00E+00	=	NA
Manganese	5.57E-10	x	0.00E+00	=	0.00E+00	1.39E-09	/	1.43E-05	=	9.75E-05
Mercury	2.68E-14	x	0.00E+00	=	0.00E+00	6.69E-14	/	8.57E-05	=	7.81E-10
Molybdenum	3.84E-12	x	0.00E+00	=	0.00E+00	9.59E-12	/	0.00E+00	=	NA
Nickel	2.06E-11	x	9.10E-01	=	1.87E-11	5.14E-11	/	2.57E-05	=	2.00E-06
Nitrate	1.20E-11	x	0.00E+00	=	0.00E+00	3.01E-11	/	0.00E+00	=	NA
Nitrite	4.85E-12	x	0.00E+00	=	0.00E+00	1.21E-11	/	0.00E+00	=	NA
Selenium	2.11E-12	x	0.00E+00	=	0.00E+00	5.28E-12	/	5.71E-03	=	9.25E-10
Silver	1.47E-13	x	0.00E+00	=	0.00E+00	3.68E-13	/	0.00E+00	=	NA
Strontium	4.85E-11	x	0.00E+00	=	0.00E+00	1.21E-10	/	0.00E+00	=	NA
Total Uranium	1.08E-12	x	0.00E+00	=	0.00E+00	2.69E-12	/	1.14E-05	=	2.36E-07
Vanadium	9.25E-11	x	0.00E+00	=	0.00E+00	2.31E-10	/	2.86E-05	=	8.10E-06
Zinc	5.95E-11	x	0.00E+00	=	0.00E+00	1.49E-10	/	0.00E+00	=	NA
Acetone	7.23E-14	x	0.00E+00	=	0.00E+00	1.81E-13	/	8.86E+00	=	2.04E-14
1-Butanol	3.48E-14	x	0.00E+00	=	0.00E+00	8.69E-14	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	2.88E-12	x	8.40E-03	=	2.42E-14	7.20E-12	/	0.00E+00	=	NA
Butylbenzylphthalate	9.27E-14	x	0.00E+00	=	0.00E+00	2.32E-13	/	0.00E+00	=	NA
Hexane	9.47E-14	x	0.00E+00	=	0.00E+00	2.37E-13	/	2.00E-01	=	1.18E-12
beta-BHC	3.55E-14	x	1.86E+00	=	6.58E-14	8.86E-14	/	0.00E+00	=	NA
			Pathway total =		5.14E-10			Pathway total =		1.50E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.8E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.9E-04
Arsenic	Sum of all pathways	=	4.11E-07	Sum of all pathways	=	3.4E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-04
Beryllium	Sum of all pathways	=	2.16E-12	Sum of all pathways	=	2.4E-05
Cadmium	Sum of all pathways	=	9.43E-13	Sum of all pathways	=	2.7E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.2E-04
Cobalt	Sum of all pathways	=	4.07E-10	Sum of all pathways	=	7.9E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.7E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.0E-06
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.6E-03
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.0E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.2E-04
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.8E-10
Molybdenum	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-04
Nickel	Sum of all pathways	=	1.87E-11	Sum of all pathways	=	1.9E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.1E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-06
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.7E-05
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.4E-06
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-05
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.6E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.4E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.6E-05
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-08
1-Butanol	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.3E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.96E-09	Sum of all pathways	=	2.6E-05
Butylbenzylphthalate	Sum of all pathways	=	8.57E-12	Sum of all pathways	=	8.5E-08
Hexane	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.9E-07
beta-BHC	Sum of all pathways	=	3.11E-09	Sum of all pathways	=	**NA**

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	4.17E-07	All Pathways and Chemicals	=	2.89E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation Units	CDIingestion mg/kg-day	=	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																					
Aluminum	5.43E-04	=	[	7.13E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	1.79E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	3.86E-07	=	[	5.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	6.21E-06	=	[	8.15E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	2.10E-08	=	[	2.76E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cadmium	9.20E-09	=	[	1.21E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	9.45E-07	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.98E-07	=	[	9.16E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	9.73E-07	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	2.19E-07	=	[	2.87E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.93E-03	=	[	2.53E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	6.37E-07	=	[	8.37E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.78E-05	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	1.46E-09	=	[	1.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	8.46E-07	=	[	1.11E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	8.71E-07	=	[	1.14E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	3.51E-07	=	[	4.61E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Silver	1.35E-08	=	[	1.77E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	2.53E-06	=	[	3.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Tin	1.10E-06	=	[	1.44E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	1.19E-07	=	[	1.57E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	5.92E-06	=	[	7.78E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	1.40E-05	=	[	1.83E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Acetone	7.47E-10	=	[	9.80E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Bis(2-ethylhexyl) phthalate	1.75E-07	=	[	2.30E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Di-n-butylphthalate	6.58E-08	=	[	8.63E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Methylene chloride	1.02E-10	=	[	1.34E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Toluene	2.24E-11	=	[	2.94E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
beta-BHC	1.97E-09	=	[	2.58E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Aroclor-1260	2.04E-09	=	[	2.68E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	2.04E-03	=	[	7.13E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	6.72E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	1.45E-06	=	[	5.06E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.33E-05	=	[	8.15E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	7.89E-08	=	[	2.76E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cadmium	3.45E-08	=	[	1.21E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	3.54E-06	=	[	1.24E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.62E-06	=	[	9.16E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.65E-06	=	[	1.28E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	8.21E-07	=	[	2.87E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	7.23E-03	=	[	2.53E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.39E-06	=	[	8.37E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.04E-04	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	5.49E-09	=	[	1.92E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	3.17E-06	=	[	1.11E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	3.27E-06	=	[	1.14E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	1.32E-06	=	[	4.61E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Silver	5.07E-08	=	[	1.77E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	9.47E-06	=	[	3.31E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Tin	4.11E-06	=	[	1.44E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	4.48E-07	=	[	1.57E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	2.22E-05	=	[	7.78E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	5.24E-05	=	[	1.83E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Acetone	2.80E-09	=	[	9.80E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Bis(2-ethylhexyl) phthalate	6.57E-07	=	[	2.30E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Di-n-butylphthalate	2.47E-07	=	[	8.63E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Methylene chloride	3.83E-10	=	[	1.34E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Toluene	8.40E-11	=	[	2.94E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
beta-BHC	7.37E-09	=	[	2.58E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Aroclor-1260	7.66E-09	=	[	2.68E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.12E-08	=	[	9.8E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.68E-13	=	[	3.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	7.93E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.28E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	4.32E-13	=	[	3.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.89E-13	=	[	1.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.94E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.43E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.00E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	4.50E-12	=	[	3.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.96E-08	=	[	3.5E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.31E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.70E-10	=	[	5.0E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.01E-14	=	[	2.6E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.74E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.79E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	7.21E-12	=	[	6.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	2.78E-13	=	[	2.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.19E-11	=	[	4.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	2.25E-11	=	[	2.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	2.46E-12	=	[	2.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.22E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	2.87E-10	=	[	2.5E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	1.53E-14	=	[	1.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	3.60E-12	=	[	3.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Di-n-butylphthalate	1.35E-12	=	[	1.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Methylene chloride	2.10E-15	=	[	1.8E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	4.60E-16	=	[	4.0E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	4.04E-14	=	[	3.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1260	4.20E-14	=	[	3.7E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	2.79E-08	=	[	9.8E-05	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	9.21E-13	=	[	3.2E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	1.98E-11	=	[	6.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.19E-10	=	[	1.1E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	1.08E-12	=	[	3.8E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cadmium	4.73E-13	=	[	1.7E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	4.85E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.58E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	5.00E-11	=	[	1.7E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	1.12E-11	=	[	3.9E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.90E-08	=	[	3.5E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	3.27E-11	=	[	1.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.43E-09	=	[	5.0E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	7.51E-14	=	[	2.6E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	4.35E-11	=	[	1.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	4.48E-11	=	[	1.6E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	1.80E-11	=	[	6.3E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Silver	6.94E-13	=	[	2.4E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.30E-10	=	[	4.5E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Tin	5.64E-11	=	[	2.0E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	6.14E-12	=	[	2.1E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	3.04E-10	=	[	1.1E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	7.18E-10	=	[	2.5E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Acetone	3.84E-14	=	[	1.3E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	9.00E-12	=	[	3.2E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Di-n-butylphthalate	3.38E-12	=	[	1.2E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Methylene chloride	5.25E-15	=	[	1.8E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Toluene	1.15E-15	=	[	4.0E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
beta-BHC	1.01E-13	=	[	3.5E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Aroclor-1260	1.05E-13	=	[	3.7E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.43E-04	x	0.00E+00	=	0.00E+00	2.04E-03	/	1.00E+00	=	2.04E-03
Antimony	1.79E-08	x	0.00E+00	=	0.00E+00	6.72E-08	/	4.00E-04	=	1.68E-04
Arsenic	3.86E-07	x	1.50E+00	=	5.79E-07	1.45E-06	/	3.00E-04	=	4.82E-03
Barium	6.21E-06	x	0.00E+00	=	0.00E+00	2.33E-05	/	2.00E-01	=	1.16E-04
Beryllium	2.10E-08	x	0.00E+00	=	0.00E+00	7.89E-08	/	2.00E-03	=	3.94E-05
Cadmium	9.20E-09	x	0.00E+00	=	0.00E+00	3.45E-08	/	1.00E-03	=	3.45E-05
Chromium	9.45E-07	x	0.00E+00	=	0.00E+00	3.54E-06	/	3.00E-03	=	1.18E-03
Cobalt	6.98E-07	x	0.00E+00	=	0.00E+00	2.62E-06	/	3.00E-04	=	8.72E-03
Copper	9.73E-07	x	0.00E+00	=	0.00E+00	3.65E-06	/	4.00E-02	=	9.12E-05
Fluoride	2.19E-07	x	0.00E+00	=	0.00E+00	8.21E-07	/	4.00E-02	=	2.05E-05
Iron	1.93E-03	x	0.00E+00	=	0.00E+00	7.23E-03	/	7.00E-01	=	1.03E-02
Lithium	6.37E-07	x	0.00E+00	=	0.00E+00	2.39E-06	/	2.00E-03	=	1.20E-03
Manganese	2.78E-05	x	0.00E+00	=	0.00E+00	1.04E-04	/	1.40E-01	=	7.43E-04
Mercury	1.46E-09	x	0.00E+00	=	0.00E+00	5.49E-09	/	0.00E+00	=	NA
Nickel	8.46E-07	x	0.00E+00	=	0.00E+00	3.17E-06	/	2.00E-02	=	1.59E-04
Nitrate	8.71E-07	x	0.00E+00	=	0.00E+00	3.27E-06	/	7.10E+00	=	4.60E-07
Nitrite	3.51E-07	x	0.00E+00	=	0.00E+00	1.32E-06	/	3.00E-01	=	4.39E-06
Silver	1.35E-08	x	0.00E+00	=	0.00E+00	5.07E-08	/	5.00E-03	=	1.01E-05
Strontium	2.53E-06	x	0.00E+00	=	0.00E+00	9.47E-06	/	6.00E-01	=	1.58E-05
Tin	1.10E-06	x	0.00E+00	=	0.00E+00	4.11E-06	/	6.00E-01	=	6.86E-06
Total Uranium	1.19E-07	x	0.00E+00	=	0.00E+00	4.48E-07	/	3.00E-03	=	1.49E-04
Vanadium	5.92E-06	x	0.00E+00	=	0.00E+00	2.22E-05	/	5.00E-03	=	4.44E-03
Zinc	1.40E-05	x	0.00E+00	=	0.00E+00	5.24E-05	/	3.00E-01	=	1.75E-04
Acetone	7.47E-10	x	0.00E+00	=	0.00E+00	2.80E-09	/	9.00E-01	=	3.11E-09
Bis(2-ethylhexyl) phthalate	1.75E-07	x	1.40E-02	=	2.45E-09	6.57E-07	/	2.00E-02	=	3.29E-05
Di-n-butylphthalate	6.58E-08	x	0.00E+00	=	0.00E+00	2.47E-07	/	1.00E-01	=	2.47E-06
Methylene chloride	1.02E-10	x	2.00E-03	=	2.04E-13	3.83E-10	/	6.00E-03	=	6.38E-08
Toluene	2.24E-11	x	0.00E+00	=	0.00E+00	8.40E-11	/	8.00E-02	=	1.05E-09
beta-BHC	1.97E-09	x	1.80E+00	=	3.54E-09	7.37E-09	/	0.00E+00	=	NA
Aroclor-1260	2.04E-09	x	2.00E+00	=	4.08E-09	7.66E-09	/	0.00E+00	=	NA
			Pathway total	=	5.89E-07			Pathway total	=	3.45E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.12E-08	x	0.00E+00	=	0.00E+00	2.79E-08	/	1.43E-03	=	1.95E-05
Antimony	3.68E-13	x	0.00E+00	=	0.00E+00	9.21E-13	/	0.00E+00	=	NA
Arsenic	7.93E-12	x	1.51E+01	=	1.19E-10	1.98E-11	/	4.29E-06	=	4.62E-06
Barium	1.28E-10	x	0.00E+00	=	0.00E+00	3.19E-10	/	1.43E-04	=	2.23E-06
Beryllium	4.32E-13	x	8.40E+00	=	3.63E-12	1.08E-12	/	5.71E-06	=	1.89E-07
Cadmium	1.89E-13	x	6.30E+00	=	1.19E-12	4.73E-13	/	2.86E-06	=	1.65E-07
Chromium	1.94E-11	x	0.00E+00	=	0.00E+00	4.85E-11	/	0.00E+00	=	NA
Cobalt	1.43E-11	x	3.15E+01	=	4.52E-10	3.58E-11	/	1.71E-06	=	2.09E-05
Copper	2.00E-11	x	0.00E+00	=	0.00E+00	5.00E-11	/	0.00E+00	=	NA
Fluoride	4.50E-12	x	0.00E+00	=	0.00E+00	1.12E-11	/	3.71E-03	=	3.03E-09
Iron	3.96E-08	x	0.00E+00	=	0.00E+00	9.90E-08	/	0.00E+00	=	NA
Lithium	1.31E-11	x	0.00E+00	=	0.00E+00	3.27E-11	/	0.00E+00	=	NA
Manganese	5.70E-10	x	0.00E+00	=	0.00E+00	1.43E-09	/	1.43E-05	=	9.98E-05
Mercury	3.01E-14	x	0.00E+00	=	0.00E+00	7.51E-14	/	8.57E-05	=	8.77E-10
Nickel	1.74E-11	x	9.10E-01	=	1.58E-11	4.35E-11	/	2.57E-05	=	1.69E-06
Nitrate	1.79E-11	x	0.00E+00	=	0.00E+00	4.48E-11	/	0.00E+00	=	NA
Nitrite	7.21E-12	x	0.00E+00	=	0.00E+00	1.80E-11	/	0.00E+00	=	NA
Silver	2.78E-13	x	0.00E+00	=	0.00E+00	6.94E-13	/	0.00E+00	=	NA
Strontium	5.19E-11	x	0.00E+00	=	0.00E+00	1.30E-10	/	0.00E+00	=	NA
Tin	2.25E-11	x	0.00E+00	=	0.00E+00	5.64E-11	/	0.00E+00	=	NA
Total Uranium	2.46E-12	x	0.00E+00	=	0.00E+00	6.14E-12	/	1.14E-05	=	5.37E-07
Vanadium	1.22E-10	x	0.00E+00	=	0.00E+00	3.04E-10	/	2.86E-05	=	1.07E-05
Zinc	2.87E-10	x	0.00E+00	=	0.00E+00	7.18E-10	/	0.00E+00	=	NA
Acetone	1.53E-14	x	0.00E+00	=	0.00E+00	3.84E-14	/	8.86E+00	=	4.33E-15
Bis(2-ethylhexyl) phthalate	3.60E-12	x	8.40E-03	=	3.02E-14	9.00E-12	/	0.00E+00	=	NA
Di-n-butylphthalate	1.35E-12	x	0.00E+00	=	0.00E+00	3.38E-12	/	0.00E+00	=	NA
Methylene chloride	2.10E-15	x	3.50E-05	=	7.34E-20	5.25E-15	/	1.71E-01	=	3.06E-14
Toluene	4.60E-16	x	0.00E+00	=	0.00E+00	1.15E-15	/	1.43E+00	=	8.05E-16
beta-BHC	4.04E-14	x	1.86E+00	=	7.49E-14	1.01E-13	/	0.00E+00	=	NA
Aroclor-1260	4.20E-14	x	2.00E+00	=	8.37E-14	1.05E-13	/	0.00E+00	=	NA
			Pathway total =		5.92E-10			Pathway total =		1.60E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-04
Arsenic	Sum of all pathways	=	5.79E-07	Sum of all pathways	=	4.8E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-04
Beryllium	Sum of all pathways	=	3.63E-12	Sum of all pathways	=	4.0E-05
Cadmium	Sum of all pathways	=	1.19E-12	Sum of all pathways	=	3.5E-05
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-03
Cobalt	Sum of all pathways	=	4.52E-10	Sum of all pathways	=	8.7E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.1E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.0E-02
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.2E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.4E-04
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.8E-10
Nickel	Sum of all pathways	=	1.58E-11	Sum of all pathways	=	1.6E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.6E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.4E-06
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.0E-05
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-05
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.9E-06
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-04
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.5E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-04
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.1E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.45E-09	Sum of all pathways	=	3.3E-05
Di-n-butylphthalate	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.5E-06
Methylene chloride	Sum of all pathways	=	2.04E-13	Sum of all pathways	=	6.4E-08
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-09
beta-BHC	Sum of all pathways	=	3.54E-09	Sum of all pathways	=	**NA**
Aroclor-1260	Sum of all pathways	=	4.08E-09	Sum of all pathways	=	**NA**

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.89E-07	All Pathways and Chemicals	=	3.47E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	6.39E-04	x	0.00E+00	=	0.00E+00	2.40E-03	/	1.00E+00	=	2.40E-03
Antimony	1.87E-08	x	0.00E+00	=	0.00E+00	7.00E-08	/	4.00E-04	=	1.75E-04
Arsenic	4.44E-07	x	1.50E+00	=	6.66E-07	1.67E-06	/	3.00E-04	=	5.55E-03
Barium	6.03E-06	x	0.00E+00	=	0.00E+00	2.26E-05	/	2.00E-01	=	1.13E-04
Beryllium	1.33E-08	x	0.00E+00	=	0.00E+00	5.00E-08	/	2.00E-03	=	2.50E-05
Cadmium	2.64E-07	x	0.00E+00	=	0.00E+00	9.91E-07	/	1.00E-03	=	9.91E-04
Chromium	8.53E-07	x	0.00E+00	=	0.00E+00	3.20E-06	/	3.00E-03	=	1.07E-03
Cobalt	8.00E-07	x	0.00E+00	=	0.00E+00	3.00E-06	/	3.00E-04	=	1.00E-02
Copper	1.13E-06	x	0.00E+00	=	0.00E+00	4.23E-06	/	4.00E-02	=	1.06E-04
Fluoride	2.69E-07	x	0.00E+00	=	0.00E+00	1.01E-06	/	4.00E-02	=	2.52E-05
Iron	1.97E-03	x	0.00E+00	=	0.00E+00	7.40E-03	/	7.00E-01	=	1.06E-02
Lithium	6.90E-07	x	0.00E+00	=	0.00E+00	2.59E-06	/	2.00E-03	=	1.29E-03
Manganese	3.12E-05	x	0.00E+00	=	0.00E+00	1.17E-04	/	1.40E-01	=	8.35E-04
Mercury	1.03E-09	x	0.00E+00	=	0.00E+00	3.86E-09	/	0.00E+00	=	NA
Nickel	8.38E-07	x	0.00E+00	=	0.00E+00	3.14E-06	/	2.00E-02	=	1.57E-04
Nitrate	3.02E-06	x	0.00E+00	=	0.00E+00	1.13E-05	/	7.10E+00	=	1.60E-06
Nitrite	4.05E-07	x	0.00E+00	=	0.00E+00	1.52E-06	/	3.00E-01	=	5.06E-06
Selenium	5.34E-08	x	0.00E+00	=	0.00E+00	2.00E-07	/	5.00E-03	=	4.01E-05
Silver	5.29E-09	x	0.00E+00	=	0.00E+00	1.98E-08	/	5.00E-03	=	3.97E-06
Strontium	2.84E-06	x	0.00E+00	=	0.00E+00	1.07E-05	/	6.00E-01	=	1.78E-05
Total Uranium	5.03E-08	x	0.00E+00	=	0.00E+00	1.89E-07	/	3.00E-03	=	6.28E-05
Vanadium	4.89E-06	x	0.00E+00	=	0.00E+00	1.83E-05	/	5.00E-03	=	3.67E-03
Zinc	3.70E-06	x	0.00E+00	=	0.00E+00	1.39E-05	/	3.00E-01	=	4.63E-05
Acetone	4.88E-10	x	0.00E+00	=	0.00E+00	1.83E-09	/	9.00E-01	=	2.03E-09
Butylbenzylphthalate	8.15E-09	x	1.90E-03	=	1.55E-11	3.06E-08	/	2.00E-01	=	1.53E-07
2-Hexanone	2.11E-10	x	0.00E+00	=	0.00E+00	7.91E-10	/	5.00E-03	=	1.58E-07
Methylene chloride	1.07E-10	x	2.00E-03	=	2.13E-13	4.00E-10	/	6.00E-03	=	6.67E-08
Toluene	4.51E-11	x	0.00E+00	=	0.00E+00	1.69E-10	/	8.00E-02	=	2.11E-09
			Pathway total	=	6.66E-07			Pathway total	=	3.72E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.31E-08	x	0.00E+00	=	0.00E+00	3.28E-08	/	1.43E-03	=	2.30E-05
Antimony	3.84E-13	x	0.00E+00	=	0.00E+00	9.59E-13	/	0.00E+00	=	NA
Arsenic	9.13E-12	x	1.51E+01	=	1.37E-10	2.28E-11	/	4.29E-06	=	5.32E-06
Barium	1.24E-10	x	0.00E+00	=	0.00E+00	3.10E-10	/	1.43E-04	=	2.17E-06
Beryllium	2.74E-13	x	8.40E+00	=	2.30E-12	6.85E-13	/	5.71E-06	=	1.20E-07
Cadmium	5.43E-12	x	6.30E+00	=	3.42E-11	1.36E-11	/	2.86E-06	=	4.75E-06
Chromium	1.75E-11	x	0.00E+00	=	0.00E+00	4.38E-11	/	0.00E+00	=	NA
Cobalt	1.64E-11	x	3.15E+01	=	5.18E-10	4.11E-11	/	1.71E-06	=	2.40E-05
Copper	2.32E-11	x	0.00E+00	=	0.00E+00	5.79E-11	/	0.00E+00	=	NA
Fluoride	5.53E-12	x	0.00E+00	=	0.00E+00	1.38E-11	/	3.71E-03	=	3.72E-09
Iron	4.05E-08	x	0.00E+00	=	0.00E+00	1.01E-07	/	0.00E+00	=	NA
Lithium	1.42E-11	x	0.00E+00	=	0.00E+00	3.54E-11	/	0.00E+00	=	NA
Manganese	6.40E-10	x	0.00E+00	=	0.00E+00	1.60E-09	/	1.43E-05	=	1.12E-04
Mercury	2.11E-14	x	0.00E+00	=	0.00E+00	5.28E-14	/	8.57E-05	=	6.16E-10
Nickel	1.72E-11	x	9.10E-01	=	1.57E-11	4.31E-11	/	2.57E-05	=	1.67E-06
Nitrate	6.22E-11	x	0.00E+00	=	0.00E+00	1.55E-10	/	0.00E+00	=	NA
Nitrite	8.31E-12	x	0.00E+00	=	0.00E+00	2.08E-11	/	0.00E+00	=	NA
Selenium	1.10E-12	x	0.00E+00	=	0.00E+00	2.74E-12	/	5.71E-03	=	4.80E-10
Silver	1.09E-13	x	0.00E+00	=	0.00E+00	2.72E-13	/	0.00E+00	=	NA
Strontium	5.84E-11	x	0.00E+00	=	0.00E+00	1.46E-10	/	0.00E+00	=	NA
Total Uranium	1.03E-12	x	0.00E+00	=	0.00E+00	2.58E-12	/	1.14E-05	=	2.26E-07
Vanadium	1.01E-10	x	0.00E+00	=	0.00E+00	2.51E-10	/	2.86E-05	=	8.79E-06
Zinc	7.61E-11	x	0.00E+00	=	0.00E+00	1.90E-10	/	0.00E+00	=	NA
Acetone	1.00E-14	x	0.00E+00	=	0.00E+00	2.50E-14	/	8.86E+00	=	2.83E-15
Butylbenzylphthalate	1.68E-13	x	0.00E+00	=	0.00E+00	4.19E-13	/	0.00E+00	=	NA
2-Hexanone	4.34E-15	x	0.00E+00	=	0.00E+00	1.08E-14	/	8.57E-03	=	1.26E-12
Methylene chloride	2.19E-15	x	3.50E-05	=	7.67E-20	5.48E-15	/	1.71E-01	=	3.20E-14
Toluene	9.27E-16	x	0.00E+00	=	0.00E+00	2.32E-15	/	1.43E+00	=	1.62E-15
			Pathway total =		7.07E-10			Pathway total =		1.82E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Arsenic	Sum of all pathways	=	6.66E-07	Sum of all pathways	=	5.6E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Beryllium	Sum of all pathways	=	2.30E-12	Sum of all pathways	=	2.5E-05
Cadmium	Sum of all pathways	=	3.42E-11	Sum of all pathways	=	1.0E-03
Chromium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Cobalt	Sum of all pathways	=	5.18E-10	Sum of all pathways	=	1.0E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-10
Nickel	Sum of all pathways	=	1.57E-11	Sum of all pathways	=	1.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-09
Butylbenzylphthalate	Sum of all pathways	=	1.55E-11	Sum of all pathways	=	1.5E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-07
Methylene chloride	Sum of all pathways	=	2.13E-13	Sum of all pathways	=	6.7E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	6.67E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.73E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
CARCINOGENIC EFFECTS																					
Aluminum	6.30E-04	=	[	8.27E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Antimony	2.22E-08	=	[	2.91E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Arsenic	5.33E-07	=	[	7.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Barium	7.38E-06	=	[	9.69E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Beryllium	1.79E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Boron	4.89E-07	=	[	6.42E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Chromium	7.62E-07	=	[	1.00E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Cobalt	6.65E-07	=	[	8.73E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Copper	1.01E-06	=	[	1.32E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Fluoride	1.54E-07	=	[	2.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Iron	1.76E-03	=	[	2.31E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Lithium	7.04E-07	=	[	9.24E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Manganese	2.77E-05	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Mercury	1.57E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Molybdenum	1.93E-07	=	[	2.53E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nickel	7.47E-07	=	[	9.80E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrate	6.48E-07	=	[	8.51E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Nitrite	1.67E-07	=	[	2.19E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Selenium	1.52E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Strontium	3.78E-06	=	[	4.96E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Total Uranium	4.71E-08	=	[	6.18E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Vanadium	3.95E-06	=	[	5.19E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Zinc	3.45E-06	=	[	4.53E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Acetone	4.71E-10	=	[	6.18E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Benzene	2.50E-11	=	[	3.28E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Styrene	2.87E-11	=	[	3.77E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]
Toluene	5.62E-11	=	[	7.38E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
NONCARCINOGENIC EFFECTS																				
Aluminum	2.36E-03	=	[	8.27E+03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Antimony	8.31E-08	=	[	2.91E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Arsenic	2.00E-06	=	[	7.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Barium	2.77E-05	=	[	9.69E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Beryllium	6.71E-08	=	[	2.35E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Boron	1.83E-06	=	[	6.42E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Chromium	2.86E-06	=	[	1.00E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Cobalt	2.49E-06	=	[	8.73E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Copper	3.77E-06	=	[	1.32E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Fluoride	5.77E-07	=	[	2.02E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Iron	6.60E-03	=	[	2.31E+04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Lithium	2.64E-06	=	[	9.24E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Manganese	1.04E-04	=	[	3.64E+02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Mercury	5.89E-09	=	[	2.06E-02	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Molybdenum	7.23E-07	=	[	2.53E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nickel	2.80E-06	=	[	9.80E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrate	2.43E-06	=	[	8.51E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Nitrite	6.26E-07	=	[	2.19E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Selenium	5.71E-07	=	[	2.00E+00	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Strontium	1.42E-05	=	[	4.96E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Total Uranium	1.76E-07	=	[	6.18E-01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Vanadium	1.48E-05	=	[	5.19E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Zinc	1.29E-05	=	[	4.53E+01	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Acetone	1.77E-09	=	[	6.18E-03	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Benzene	9.37E-11	=	[	3.28E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Styrene	1.08E-10	=	[	3.77E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]
Toluene	2.11E-10	=	[	7.38E-04	x	50	x	1	x	1.00E-06	x	0.4	x	20	]	/	[	70	x	20	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Adult Industrial Worker under MTCA Method C
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.29E-08	=	[	1.1E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.56E-13	=	[	4.0E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	1.10E-11	=	[	9.6E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.52E-10	=	[	1.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	3.68E-13	=	[	3.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	1.01E-11	=	[	8.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.57E-11	=	[	1.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.37E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.07E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.16E-12	=	[	2.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.62E-08	=	[	3.2E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.45E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.70E-10	=	[	5.0E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.23E-14	=	[	2.8E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.96E-12	=	[	3.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.53E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.33E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.43E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	3.13E-12	=	[	2.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	7.77E-11	=	[	6.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	9.67E-13	=	[	8.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	8.13E-11	=	[	7.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.09E-11	=	[	6.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	9.68E-15	=	[	8.5E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Benzene	5.14E-16	=	[	4.5E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	5.90E-16	=	[	5.2E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	0.00E+00	=	[	0.0E+00	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	3.24E-08	=	[	1.1E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Antimony	1.14E-12	=	[	4.0E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Arsenic	2.74E-11	=	[	9.6E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Barium	3.79E-10	=	[	1.3E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Beryllium	9.20E-13	=	[	3.2E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Boron	2.51E-11	=	[	8.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Chromium	3.91E-11	=	[	1.4E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Cobalt	3.42E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Copper	5.17E-11	=	[	1.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Fluoride	7.91E-12	=	[	2.8E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Iron	9.04E-08	=	[	3.2E-04	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Lithium	3.62E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Manganese	1.42E-09	=	[	5.0E-06	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Mercury	8.06E-14	=	[	2.8E-10	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Molybdenum	9.90E-12	=	[	3.5E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nickel	3.84E-11	=	[	1.3E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrate	3.33E-11	=	[	1.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Nitrite	8.57E-12	=	[	3.0E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Selenium	7.83E-12	=	[	2.7E-08	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Strontium	1.94E-10	=	[	6.8E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Total Uranium	2.42E-12	=	[	8.5E-09	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Vanadium	2.03E-10	=	[	7.1E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Zinc	1.77E-10	=	[	6.2E-07	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Acetone	2.42E-14	=	[	8.5E-11	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Benzene	1.28E-15	=	[	4.5E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Styrene	1.48E-15	=	[	5.2E-12	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]
Toluene	0.00E+00	=	[	0.0E+00	x	1	x	20	x	6	]	/	[(	6	x	70	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method C
Adult Industrial Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	6.30E-04	x	0.00E+00	=	0.00E+00	2.36E-03	/	1.00E+00	=	2.36E-03
Antimony	2.22E-08	x	0.00E+00	=	0.00E+00	8.31E-08	/	4.00E-04	=	2.08E-04
Arsenic	5.33E-07	x	1.50E+00	=	8.00E-07	2.00E-06	/	3.00E-04	=	6.67E-03
Barium	7.38E-06	x	0.00E+00	=	0.00E+00	2.77E-05	/	2.00E-01	=	1.38E-04
Beryllium	1.79E-08	x	0.00E+00	=	0.00E+00	6.71E-08	/	2.00E-03	=	3.36E-05
Boron	4.89E-07	x	0.00E+00	=	0.00E+00	1.83E-06	/	2.00E-01	=	9.17E-06
Chromium	7.62E-07	x	0.00E+00	=	0.00E+00	2.86E-06	/	3.00E-03	=	9.52E-04
Cobalt	6.65E-07	x	0.00E+00	=	0.00E+00	2.49E-06	/	3.00E-04	=	8.31E-03
Copper	1.01E-06	x	0.00E+00	=	0.00E+00	3.77E-06	/	4.00E-02	=	9.43E-05
Fluoride	1.54E-07	x	0.00E+00	=	0.00E+00	5.77E-07	/	4.00E-02	=	1.44E-05
Iron	1.76E-03	x	0.00E+00	=	0.00E+00	6.60E-03	/	7.00E-01	=	9.43E-03
Lithium	7.04E-07	x	0.00E+00	=	0.00E+00	2.64E-06	/	2.00E-03	=	1.32E-03
Manganese	2.77E-05	x	0.00E+00	=	0.00E+00	1.04E-04	/	1.40E-01	=	7.43E-04
Mercury	1.57E-09	x	0.00E+00	=	0.00E+00	5.89E-09	/	0.00E+00	=	NA
Molybdenum	1.93E-07	x	0.00E+00	=	0.00E+00	7.23E-07	/	5.00E-03	=	1.45E-04
Nickel	7.47E-07	x	0.00E+00	=	0.00E+00	2.80E-06	/	2.00E-02	=	1.40E-04
Nitrate	6.48E-07	x	0.00E+00	=	0.00E+00	2.43E-06	/	7.10E+00	=	3.42E-07
Nitrite	1.67E-07	x	0.00E+00	=	0.00E+00	6.26E-07	/	3.00E-01	=	2.09E-06
Selenium	1.52E-07	x	0.00E+00	=	0.00E+00	5.71E-07	/	5.00E-03	=	1.14E-04
Strontium	3.78E-06	x	0.00E+00	=	0.00E+00	1.42E-05	/	6.00E-01	=	2.36E-05
Total Uranium	4.71E-08	x	0.00E+00	=	0.00E+00	1.76E-07	/	3.00E-03	=	5.88E-05
Vanadium	3.95E-06	x	0.00E+00	=	0.00E+00	1.48E-05	/	5.00E-03	=	2.97E-03
Zinc	3.45E-06	x	0.00E+00	=	0.00E+00	1.29E-05	/	3.00E-01	=	4.31E-05
Acetone	4.71E-10	x	0.00E+00	=	0.00E+00	1.77E-09	/	9.00E-01	=	1.96E-09
Benzene	2.50E-11	x	5.50E-02	=	1.37E-12	9.37E-11	/	4.00E-03	=	2.34E-08
Styrene	2.87E-11	x	0.00E+00	=	0.00E+00	1.08E-10	/	2.00E-01	=	5.39E-10
Toluene	5.62E-11	x	0.00E+00	=	0.00E+00	2.11E-10	/	8.00E-02	=	2.64E-09
			Pathway total	=	8.00E-07			Pathway total	=	3.38E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.29E-08	x	0.00E+00	=	0.00E+00	3.24E-08	/	1.43E-03	=	2.27E-05
Antimony	4.56E-13	x	0.00E+00	=	0.00E+00	1.14E-12	/	0.00E+00	=	NA
Arsenic	1.10E-11	x	1.51E+01	=	1.65E-10	2.74E-11	/	4.29E-06	=	6.39E-06
Barium	1.52E-10	x	0.00E+00	=	0.00E+00	3.79E-10	/	1.43E-04	=	2.65E-06
Beryllium	3.68E-13	x	8.40E+00	=	3.09E-12	9.20E-13	/	5.71E-06	=	1.61E-07
Boron	1.01E-11	x	0.00E+00	=	0.00E+00	2.51E-11	/	5.71E-03	=	4.40E-09
Chromium	1.57E-11	x	0.00E+00	=	0.00E+00	3.91E-11	/	0.00E+00	=	NA
Cobalt	1.37E-11	x	3.15E+01	=	4.31E-10	3.42E-11	/	1.71E-06	=	1.99E-05
Copper	2.07E-11	x	0.00E+00	=	0.00E+00	5.17E-11	/	0.00E+00	=	NA
Fluoride	3.16E-12	x	0.00E+00	=	0.00E+00	7.91E-12	/	3.71E-03	=	2.13E-09
Iron	3.62E-08	x	0.00E+00	=	0.00E+00	9.04E-08	/	0.00E+00	=	NA
Lithium	1.45E-11	x	0.00E+00	=	0.00E+00	3.62E-11	/	0.00E+00	=	NA
Manganese	5.70E-10	x	0.00E+00	=	0.00E+00	1.42E-09	/	1.43E-05	=	9.97E-05
Mercury	3.23E-14	x	0.00E+00	=	0.00E+00	8.06E-14	/	8.57E-05	=	9.41E-10
Molybdenum	3.96E-12	x	0.00E+00	=	0.00E+00	9.90E-12	/	0.00E+00	=	NA
Nickel	1.53E-11	x	9.10E-01	=	1.40E-11	3.84E-11	/	2.57E-05	=	1.49E-06
Nitrate	1.33E-11	x	0.00E+00	=	0.00E+00	3.33E-11	/	0.00E+00	=	NA
Nitrite	3.43E-12	x	0.00E+00	=	0.00E+00	8.57E-12	/	0.00E+00	=	NA
Selenium	3.13E-12	x	0.00E+00	=	0.00E+00	7.83E-12	/	5.71E-03	=	1.37E-09
Strontium	7.77E-11	x	0.00E+00	=	0.00E+00	1.94E-10	/	0.00E+00	=	NA
Total Uranium	9.67E-13	x	0.00E+00	=	0.00E+00	2.42E-12	/	1.14E-05	=	2.11E-07
Vanadium	8.13E-11	x	0.00E+00	=	0.00E+00	2.03E-10	/	2.86E-05	=	7.11E-06
Zinc	7.09E-11	x	0.00E+00	=	0.00E+00	1.77E-10	/	0.00E+00	=	NA
Acetone	9.68E-15	x	0.00E+00	=	0.00E+00	2.42E-14	/	8.86E+00	=	2.73E-15
Benzene	5.14E-16	x	2.73E-02	=	1.40E-17	1.28E-15	/	8.57E-03	=	1.50E-13
Styrene	5.90E-16	x	0.00E+00	=	0.00E+00	1.48E-15	/	2.86E-01	=	5.16E-15
Toluene	0.00E+00	x	0.00E+00	=	0.00E+00	0.00E+00	/	1.43E+00	=	0.00E+00
			Pathway total =		6.13E-10			Pathway total =		1.60E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.4E-03
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-04
Arsenic	Sum of all pathways	=	8.00E-07	Sum of all pathways	=	6.7E-03
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-04
Beryllium	Sum of all pathways	=	3.09E-12	Sum of all pathways	=	3.4E-05
Boron	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.2E-06
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.5E-04
Cobalt	Sum of all pathways	=	4.31E-10	Sum of all pathways	=	8.3E-03
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.4E-05
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-05
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.4E-03
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-03
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.4E-04
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.4E-10
Molybdenum	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-04
Nickel	Sum of all pathways	=	1.40E-11	Sum of all pathways	=	1.4E-04
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.4E-07
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-06
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-04
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.4E-05
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.9E-05
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-03
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.3E-05
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-09
Benzene	Sum of all pathways	=	1.37E-12	Sum of all pathways	=	2.3E-08
Styrene	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.4E-10
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.6E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	8.01E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.39E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Industrial Adult Worker under Method C

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	4E-07	2E-06	6E-07	4E-07	6E-07	9E-07	4E-07	6E-07	7E-07	8E-07
Inhalation	6E-10	1E-09	6E-10	5E-10	6E-10	6E-10	5E-10	6E-10	7E-10	6E-10
ELCR	4E-07	2E-06	6E-07	4E-07	6E-07	9E-07	4E-07	6E-07	7E-07	8E-07
Risk Contributors	**None**									
Noncancer Hazard for Residential Adult- Nonradiological COPCs										
Soil Ingestion	3E-02	5E-02	3E-02	3E-02	4E-02	4E-02	3E-02	3E-02	4E-02	3.4E-02
Inhalation	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04
HI	0.03	0.05	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.03
Hazard Contributor	**None**									

Appendix C

Attachment C-3: Results of Nonradiological Risk Assessment under Construction Worker Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	4.18E-05	=	[	7.55E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.47E-09	=	[	2.65E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.08E-08	=	[	3.75E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	4.71E-07	=	[	8.50E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	5.35E-10	=	[	9.67E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	5.28E-08	=	[	9.54E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	5.03E-08	=	[	9.09E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	7.06E-08	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.23E-08	=	[	2.23E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.33E-04	=	[	2.41E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	4.61E-08	=	[	8.33E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	1.96E-06	=	[	3.54E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	6.00E-08	=	[	1.08E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	5.02E-08	=	[	9.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	5.12E-09	=	[	9.25E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	2.67E-10	=	[	4.83E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	2.09E-07	=	[	3.77E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Tin	6.42E-08	=	[	1.16E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.19E-09	=	[	5.77E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.32E-07	=	[	6.00E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.52E-07	=	[	4.56E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Diethylphthalate	1.88E-09	=	[	3.40E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1254	4.17E-11	=	[	7.54E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.93E-03	=	[	7.55E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	1.03E-07	=	[	2.65E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.45E-06	=	[	3.75E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.29E-05	=	[	8.50E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	3.75E-08	=	[	9.67E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	3.70E-06	=	[	9.54E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.52E-06	=	[	9.09E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	4.94E-06	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	8.62E-07	=	[	2.23E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	9.33E-03	=	[	2.41E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.23E-06	=	[	8.33E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.37E-04	=	[	3.54E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	4.20E-06	=	[	1.08E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	3.51E-06	=	[	9.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	3.59E-07	=	[	9.25E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	1.87E-08	=	[	4.83E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.46E-05	=	[	3.77E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Tin	4.49E-06	=	[	1.16E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.24E-07	=	[	5.77E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.32E-05	=	[	6.00E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.77E-05	=	[	4.56E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Diethylphthalate	1.32E-07	=	[	3.40E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1254	2.92E-09	=	[	7.54E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.90E-04	=	[	2.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	3.13E-08	=	[	8.0E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	4.42E-07	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	1.00E-05	=	[	2.6E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.14E-08	=	[	2.9E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.12E-06	=	[	2.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.07E-06	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.50E-06	=	[	3.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	2.62E-07	=	[	6.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.84E-03	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	9.82E-07	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.17E-05	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.28E-06	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	1.07E-06	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	1.09E-07	=	[	2.8E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	5.69E-09	=	[	1.5E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	4.45E-06	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Tin	1.37E-06	=	[	3.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	6.80E-08	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	7.07E-06	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	5.37E-06	=	[	1.4E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Diethylphthalate	4.01E-08	=	[	1.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Aroclor-1254	8.89E-10	=	[	2.3E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	6.23E-02	=	[	2.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.19E-06	=	[	8.0E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	3.10E-05	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	7.01E-04	=	[	2.6E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	7.98E-07	=	[	2.9E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	7.87E-05	=	[	2.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	7.50E-05	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.05E-04	=	[	3.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.84E-05	=	[	6.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	1.99E-01	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	6.88E-05	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	2.92E-03	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	8.95E-05	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	7.48E-05	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	7.64E-06	=	[	2.8E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	3.98E-07	=	[	1.5E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	3.11E-04	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Tin	9.57E-05	=	[	3.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	4.76E-06	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	4.95E-04	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.76E-04	=	[	1.4E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Diethylphthalate	2.81E-06	=	[	1.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Aroclor-1254	6.22E-08	=	[	2.3E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.87E-09	=	[	3.75E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.61E-12	=	[	9.67E-02	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Diethylphthalate	5.65E-10	=	[	3.40E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1254	1.75E-11	=	[	7.54E-03	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.31E-07	=	[	3.75E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.12E-10	=	[	9.67E-02	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Diethylphthalate	3.95E-08	=	[	3.40E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1254	1.23E-09	=	[	7.54E-03	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.18E-05	x	0.00E+00	=	0.00E+00	2.93E-03	/	1.00E+00	=	2.93E-03
Antimony	1.47E-09	x	0.00E+00	=	0.00E+00	1.03E-07	/	4.00E-04	=	2.57E-04
Arsenic	2.08E-08	x	1.50E+00	=	3.11E-08	1.45E-06	/	3.00E-04	=	4.84E-03
Barium	4.71E-07	x	0.00E+00	=	0.00E+00	3.29E-05	/	2.00E-01	=	1.65E-04
Cadmium	5.35E-10	x	0.00E+00	=	0.00E+00	3.75E-08	/	1.00E-03	=	3.75E-05
Chromium	5.28E-08	x	0.00E+00	=	0.00E+00	3.70E-06	/	3.00E-03	=	1.23E-03
Cobalt	5.03E-08	x	0.00E+00	=	0.00E+00	3.52E-06	/	3.00E-04	=	1.17E-02
Copper	7.06E-08	x	0.00E+00	=	0.00E+00	4.94E-06	/	4.00E-02	=	1.24E-04
Fluoride	1.23E-08	x	0.00E+00	=	0.00E+00	8.62E-07	/	4.00E-02	=	2.16E-05
Iron	1.33E-04	x	0.00E+00	=	0.00E+00	9.33E-03	/	7.00E-01	=	1.33E-02
Lithium	4.61E-08	x	0.00E+00	=	0.00E+00	3.23E-06	/	2.00E-03	=	1.61E-03
Manganese	1.96E-06	x	0.00E+00	=	0.00E+00	1.37E-04	/	1.40E-01	=	9.80E-04
Nickel	6.00E-08	x	0.00E+00	=	0.00E+00	4.20E-06	/	2.00E-02	=	2.10E-04
Nitrate	5.02E-08	x	0.00E+00	=	0.00E+00	3.51E-06	/	1.60E+00	=	2.19E-06
Nitrite	5.12E-09	x	0.00E+00	=	0.00E+00	3.59E-07	/	1.00E-01	=	3.59E-06
Silver	2.67E-10	x	0.00E+00	=	0.00E+00	1.87E-08	/	5.00E-03	=	3.74E-06
Strontium	2.09E-07	x	0.00E+00	=	0.00E+00	1.46E-05	/	6.00E-01	=	2.44E-05
Tin	6.42E-08	x	0.00E+00	=	0.00E+00	4.49E-06	/	6.00E-01	=	7.49E-06
Total Uranium	3.19E-09	x	0.00E+00	=	0.00E+00	2.24E-07	/	3.00E-03	=	7.45E-05
Vanadium	3.32E-07	x	0.00E+00	=	0.00E+00	2.32E-05	/	5.00E-03	=	4.65E-03
Zinc	2.52E-07	x	0.00E+00	=	0.00E+00	1.77E-05	/	3.00E-01	=	5.89E-05
Diethylphthalate	1.88E-09	x	0.00E+00	=	0.00E+00	1.32E-07	/	8.00E-01	=	1.65E-07
Aroclor-1254	4.17E-11	x	2.00E+00	=	8.35E-11	2.92E-09	/	2.00E-05	=	1.46E-04
			Pathway total	=	3.12E-08			Pathway total	=	4.25E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.90E-04	x		=	NA	6.23E-02	/[	5.00E-03	x	1000	]=	1.25E-02
Antimony	3.13E-08	x		=	NA	2.19E-06	/[		x	1000	]=	NA
Arsenic	4.42E-07	x	4.30E-03	=	1.90E-09	3.10E-05	/[	1.50E-05	x	1000	]=	2.06E-03
Barium	1.00E-05	x		=	NA	7.01E-04	/[	5.00E-04	x	1000	]=	1.40E-03
Cadmium	1.14E-08	x	1.80E-03	=	2.05E-11	7.98E-07	/[	1.00E-05	x	1000	]=	7.98E-05
Chromium	1.12E-06	x	8.40E-02	=	9.44E-08	7.87E-05	/[	1.00E-04	x	1000	]=	7.87E-04
Cobalt	1.07E-06	x	9.00E-03	=	9.65E-09	7.50E-05	/[	6.00E-06	x	1000	]=	1.25E-02
Copper	1.50E-06	x		=	NA	1.05E-04	/[		x	1000	]=	NA
Fluoride	2.62E-07	x		=	NA	1.84E-05	/[	1.30E-02	x	1000	]=	1.41E-06
Iron	2.84E-03	x		=	NA	1.99E-01	/[		x	1000	]=	NA
Lithium	9.82E-07	x		=	NA	6.88E-05	/[		x	1000	]=	NA
Manganese	4.17E-05	x		=	NA	2.92E-03	/[	5.00E-05	x	1000	]=	5.84E-02
Nickel	1.28E-06	x	2.60E-04	=	3.32E-10	8.95E-05	/[	9.00E-05	x	1000	]=	9.94E-04
Nitrate	1.07E-06	x		=	NA	7.48E-05	/[		x	1000	]=	NA
Nitrite	1.09E-07	x		=	NA	7.64E-06	/[		x	1000	]=	NA
Silver	5.69E-09	x		=	NA	3.98E-07	/[		x	1000	]=	NA
Strontium	4.45E-06	x		=	NA	3.11E-04	/[		x	1000	]=	NA
Tin	1.37E-06	x		=	NA	9.57E-05	/[		x	1000	]=	NA
Total Uranium	6.80E-08	x		=	NA	4.76E-06	/[	4.00E-05	x	1000	]=	1.19E-04
Vanadium	7.07E-06	x		=	NA	4.95E-04	/[	1.00E-04	x	1000	]=	4.95E-03
Zinc	5.37E-06	x		=	NA	3.76E-04	/[		x	1000	]=	NA
Diethylphthalate	4.01E-08	x		=	NA	2.81E-06	/[		x	1000	]=	NA
Aroclor-1254	8.89E-10	x	5.70E-04	=	5.07E-13	6.22E-08	/[		x	1000	]=	NA
			Pathway total =		1.06E-07					Pathway total =		9.38E-02

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.87E-09	x	1.50E+00	=	2.80E-09	1.31E-07	/	3.00E-04	=	4.36E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	1.61E-12	x		=	NA	1.12E-10	/	2.50E-05	=	4.50E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	5.65E-10	x		=	NA	3.95E-08	/	8.00E-01	=	4.94E-08
Aroclor-1254	1.75E-11	x	2.00E+00	=	3.51E-11	1.23E-09	/	2.00E-05	=	6.13E-05
			Pathway total =		2.84E-09			Pathway total =		5.02E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Arsenic	Sum of all pathways	=	3.58E-08	Sum of all pathways	=	7.3E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Cadmium	Sum of all pathways	=	2.05E-11	Sum of all pathways	=	1.2E-04
Chromium	Sum of all pathways	=	9.44E-08	Sum of all pathways	=	2.0E-03
Cobalt	Sum of all pathways	=	9.65E-09	Sum of all pathways	=	2.4E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-02
Nickel	Sum of all pathways	=	3.32E-10	Sum of all pathways	=	1.2E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	9.6E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-05
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-07
Aroclor-1254	Sum of all pathways	=	1.19E-10	Sum of all pathways	=	2.1E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1E-07	All Pathways and Chemicals	=	1.37E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	5.26E-05	=	[	9.51E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	3.99E-09	=	[	7.21E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.17E-07	=	[	2.12E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	5.47E-07	=	[	9.88E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	2.23E-09	=	[	4.03E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	8.30E-10	=	[	1.50E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	7.09E-08	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	6.09E-08	=	[	1.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	1.00E-07	=	[	1.81E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.27E-08	=	[	2.29E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.58E-04	=	[	2.86E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	6.70E-08	=	[	1.21E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.49E-06	=	[	4.49E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	2.80E-11	=	[	5.06E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	7.20E-08	=	[	1.30E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	9.63E-08	=	[	1.74E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	1.17E-08	=	[	2.11E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	4.43E-10	=	[	8.00E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	2.47E-07	=	[	4.47E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	4.68E-09	=	[	8.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	4.35E-07	=	[	7.85E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.83E-07	=	[	5.11E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.47E-10	=	[	8.07E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.68E-03	=	[	9.51E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	2.79E-07	=	[	7.21E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	8.21E-06	=	[	2.12E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.83E-05	=	[	9.88E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	1.56E-07	=	[	4.03E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	5.81E-08	=	[	1.50E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	4.96E-06	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	4.26E-06	=	[	1.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	7.01E-06	=	[	1.81E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	8.87E-07	=	[	2.29E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	1.11E-02	=	[	2.86E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	4.69E-06	=	[	1.21E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.74E-04	=	[	4.49E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	1.96E-09	=	[	5.06E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	5.04E-06	=	[	1.30E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	6.74E-06	=	[	1.74E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	8.18E-07	=	[	2.11E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	3.10E-08	=	[	8.00E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.73E-05	=	[	4.47E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	3.28E-07	=	[	8.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	3.04E-05	=	[	7.85E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.98E-05	=	[	5.11E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	3.13E-08	=	[	8.07E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.12E-03	=	[	2.9E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	8.50E-08	=	[	2.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	2.50E-06	=	[	6.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	1.16E-05	=	[	3.0E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	4.75E-08	=	[	1.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.77E-08	=	[	4.5E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.51E-06	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.30E-06	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	2.13E-06	=	[	5.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	2.70E-07	=	[	6.9E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	3.37E-03	=	[	8.6E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	1.43E-06	=	[	3.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	5.29E-05	=	[	1.4E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	5.97E-10	=	[	1.5E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.53E-06	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	2.05E-06	=	[	5.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	2.49E-07	=	[	6.4E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	9.43E-09	=	[	2.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	5.27E-06	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	9.97E-08	=	[	2.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	9.25E-06	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	6.02E-06	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.51E-09	=	[	2.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	7.85E-02	=	[	2.9E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	5.95E-06	=	[	2.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	1.75E-04	=	[	6.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	8.15E-04	=	[	3.0E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	3.33E-06	=	[	1.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	1.24E-06	=	[	4.5E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	1.06E-04	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	9.08E-05	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.49E-04	=	[	5.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.89E-05	=	[	6.9E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	2.36E-01	=	[	8.6E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	9.99E-05	=	[	3.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.71E-03	=	[	1.4E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	4.18E-08	=	[	1.5E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	1.07E-04	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	1.44E-04	=	[	5.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	1.74E-05	=	[	6.4E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	6.60E-07	=	[	2.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	3.69E-04	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	6.98E-06	=	[	2.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	6.48E-04	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	4.22E-04	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	6.66E-07	=	[	2.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.06E-08	=	[	2.12E+01	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	2.49E-12	=	[	1.50E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.34E-10	=	[	8.07E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	7.39E-07	=	[	2.12E+01	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.74E-10	=	[	1.50E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	9.38E-09	=	[	8.07E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	5.26E-05	x	0.00E+00	=	0.00E+00	3.68E-03	/	1.00E+00	=	3.68E-03
Antimony	3.99E-09	x	0.00E+00	=	0.00E+00	2.79E-07	/	4.00E-04	=	6.98E-04
Arsenic	1.17E-07	x	1.50E+00	=	1.76E-07	8.21E-06	/	3.00E-04	=	2.74E-02
Barium	5.47E-07	x	0.00E+00	=	0.00E+00	3.83E-05	/	2.00E-01	=	1.91E-04
Beryllium	2.23E-09	x	0.00E+00	=	0.00E+00	1.56E-07	/	2.00E-03	=	7.81E-05
Cadmium	8.30E-10	x	0.00E+00	=	0.00E+00	5.81E-08	/	1.00E-03	=	5.81E-05
Chromium	7.09E-08	x	0.00E+00	=	0.00E+00	4.96E-06	/	3.00E-03	=	1.65E-03
Cobalt	6.09E-08	x	0.00E+00	=	0.00E+00	4.26E-06	/	3.00E-04	=	1.42E-02
Copper	1.00E-07	x	0.00E+00	=	0.00E+00	7.01E-06	/	4.00E-02	=	1.75E-04
Fluoride	1.27E-08	x	0.00E+00	=	0.00E+00	8.87E-07	/	4.00E-02	=	2.22E-05
Iron	1.58E-04	x	0.00E+00	=	0.00E+00	1.11E-02	/	7.00E-01	=	1.58E-02
Lithium	6.70E-08	x	0.00E+00	=	0.00E+00	4.69E-06	/	2.00E-03	=	2.34E-03
Manganese	2.49E-06	x	0.00E+00	=	0.00E+00	1.74E-04	/	1.40E-01	=	1.24E-03
Mercury	2.80E-11	x	0.00E+00	=	0.00E+00	1.96E-09	/	0.00E+00	=	NA
Nickel	7.20E-08	x	0.00E+00	=	0.00E+00	5.04E-06	/	2.00E-02	=	2.52E-04
Nitrate	9.63E-08	x	0.00E+00	=	0.00E+00	6.74E-06	/	1.60E+00	=	4.21E-06
Nitrite	1.17E-08	x	0.00E+00	=	0.00E+00	8.18E-07	/	1.00E-01	=	8.18E-06
Silver	4.43E-10	x	0.00E+00	=	0.00E+00	3.10E-08	/	5.00E-03	=	6.20E-06
Strontium	2.47E-07	x	0.00E+00	=	0.00E+00	1.73E-05	/	6.00E-01	=	2.89E-05
Total Uranium	4.68E-09	x	0.00E+00	=	0.00E+00	3.28E-07	/	3.00E-03	=	1.09E-04
Vanadium	4.35E-07	x	0.00E+00	=	0.00E+00	3.04E-05	/	5.00E-03	=	6.08E-03
Zinc	2.83E-07	x	0.00E+00			1.98E-05	/	3.00E-01	=	6.60E-05
Butylbenzylphthalate	4.47E-10	x	1.90E-03	=	8.49E-13	3.13E-08	/	2.00E-01	=	1.56E-07
			Pathway total	=	1.76E-07			Pathway total	=	7.41E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.12E-03	x		=	NA	7.85E-02	/[	5.00E-03	x	1000	]=	1.57E-02
Antimony	8.50E-08	x		=	NA	5.95E-06	/[		x	1000	]=	NA
Arsenic	2.50E-06	x	4.30E-03	=	1.07E-08	1.75E-04	/[	1.50E-05	x	1000	]=	1.17E-02
Barium	1.16E-05	x		=	NA	8.15E-04	/[	5.00E-04	x	1000	]=	1.63E-03
Beryllium	4.75E-08	x	2.40E-03	=	1.14E-10	3.33E-06	/[	2.00E-05	x	1000	]=	1.66E-04
Cadmium	1.77E-08	x	1.80E-03	=	3.18E-11	1.24E-06	/[	1.00E-05	x	1000	]=	1.24E-04
Chromium	1.51E-06	x	8.40E-02	=	1.27E-07	1.06E-04	/[	1.00E-04	x	1000	]=	1.06E-03
Cobalt	1.30E-06	x	9.00E-03	=	1.17E-08	9.08E-05	/[	6.00E-06	x	1000	]=	1.51E-02
Copper	2.13E-06	x		=	NA	1.49E-04	/[		x	1000	]=	NA
Fluoride	2.70E-07	x		=	NA	1.89E-05	/[	1.30E-02	x	1000	]=	1.45E-06
Iron	3.37E-03	x		=	NA	2.36E-01	/[		x	1000	]=	NA
Lithium	1.43E-06	x		=	NA	9.99E-05	/[		x	1000	]=	NA
Manganese	5.29E-05	x		=	NA	3.71E-03	/[	5.00E-05	x	1000	]=	7.41E-02
Mercury	5.97E-10	x	0.00E+00	=	0.00E+00	4.18E-08	/[	3.00E-04	x	1000	]=	1.39E-07
Nickel	1.53E-06	x	2.60E-04	=	3.98E-10	1.07E-04	/[	9.00E-05	x	1000	]=	1.19E-03
Nitrate	2.05E-06	x		=	NA	1.44E-04	/[		x	1000	]=	NA
Nitrite	2.49E-07	x		=	NA	1.74E-05	/[		x	1000	]=	NA
Silver	9.43E-09	x		=	NA	6.60E-07	/[		x	1000	]=	NA
Strontium	5.27E-06	x		=	NA	3.69E-04	/[		x	1000	]=	NA
Total Uranium	9.97E-08	x		=	NA	6.98E-06	/[	4.00E-05	x	1000	]=	1.74E-04
Vanadium	9.25E-06	x		=	NA	6.48E-04	/[	1.00E-04	x	1000	]=	6.48E-03
Zinc	6.02E-06	x				4.22E-04	/[		x	1000	]=	NA
Butylbenzylphthalate	9.51E-09	x	0.00E+00	=	0.00E+00	6.66E-07	/[		x	1000	]=	NA
			Pathway total =		1.50E-07					Pathway total =		1.27E-01

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.06E-08	x	1.50E+00	=	1.58E-08	7.39E-07	/	3.00E-04	=	2.46E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.49E-12	x		=	NA	1.74E-10	/	2.50E-05	=	6.97E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.34E-10	x	1.90E-03	=	2.55E-13	9.38E-09	/	2.00E-01	=	4.69E-08
			Pathway total =		1.58E-08			Pathway total =		2.47E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-04
Arsenic	Sum of all pathways	=	2.03E-07	Sum of all pathways	=	4.2E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Beryllium	Sum of all pathways	=	1.14E-10	Sum of all pathways	=	2.4E-04
Cadmium	Sum of all pathways	=	3.18E-11	Sum of all pathways	=	1.9E-04
Chromium	Sum of all pathways	=	1.27E-07	Sum of all pathways	=	2.7E-03
Cobalt	Sum of all pathways	=	1.17E-08	Sum of all pathways	=	2.9E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-07
Nickel	Sum of all pathways	=	3.98E-10	Sum of all pathways	=	1.4E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-05
Butylbenzylphthalate	Sum of all pathways	=	1.10E-12	Sum of all pathways	=	2.0E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	3E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	2.04E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.11E-05	=	[	7.42E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	9.85E-10	=	[	1.78E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.88E-08	=	[	5.20E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	4.34E-07	=	[	7.84E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	8.80E-10	=	[	1.59E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Boron	1.85E-08	=	[	3.34E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.80E-08	=	[	3.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	9.52E-08	=	[	1.72E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	4.88E-08	=	[	8.82E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	9.13E-08	=	[	1.65E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	8.19E-09	=	[	1.48E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.34E-04	=	[	2.42E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	5.05E-08	=	[	9.13E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.74E-06	=	[	4.95E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	1.28E-10	=	[	2.32E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	6.86E-08	=	[	1.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	2.78E-08	=	[	5.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	7.75E-09	=	[	1.40E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	3.10E-09	=	[	5.60E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	4.71E-10	=	[	8.50E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	1.92E-07	=	[	3.47E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	4.58E-09	=	[	8.27E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.25E-07	=	[	5.88E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.48E-07	=	[	4.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	3.67E-11	=	[	6.63E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.86E-10	=	[	1.24E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	1.87E-12	=	[	3.37E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Aldrin	1.11E-11	=	[	2.00E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.88E-03	=	[	7.42E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	6.90E-08	=	[	1.78E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.01E-06	=	[	5.20E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.04E-05	=	[	7.84E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	6.16E-08	=	[	1.59E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Boron	1.29E-06	=	[	3.34E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.26E-06	=	[	3.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	6.66E-06	=	[	1.72E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.42E-06	=	[	8.82E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	6.39E-06	=	[	1.65E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	5.73E-07	=	[	1.48E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	9.38E-03	=	[	2.42E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.54E-06	=	[	9.13E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.92E-04	=	[	4.95E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	8.99E-09	=	[	2.32E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	4.80E-06	=	[	1.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	1.95E-06	=	[	5.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	5.42E-07	=	[	1.40E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Selenium	2.17E-07	=	[	5.60E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	3.29E-08	=	[	8.50E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.34E-05	=	[	3.47E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	3.21E-07	=	[	8.27E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.28E-05	=	[	5.88E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.74E-05	=	[	4.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Acetone	2.57E-09	=	[	6.63E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	4.80E-08	=	[	1.24E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	1.31E-10	=	[	3.37E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Aldrin	7.75E-10	=	[	2.00E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.75E-04	=	[	2.2E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	2.10E-08	=	[	5.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	6.13E-07	=	[	1.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	9.24E-06	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	1.87E-08	=	[	4.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Boron	3.94E-07	=	[	1.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	3.84E-07	=	[	9.8E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	2.03E-06	=	[	5.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.04E-06	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.95E-06	=	[	5.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	1.74E-07	=	[	4.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.85E-03	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	1.08E-06	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	5.84E-05	=	[	1.5E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	2.74E-09	=	[	7.0E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.46E-06	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	5.92E-07	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	1.65E-07	=	[	4.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Selenium	6.60E-08	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	1.00E-08	=	[	2.6E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	4.09E-06	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	9.75E-08	=	[	2.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	6.93E-06	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	5.28E-06	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Acetone	7.78E-10	=	[	2.0E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.46E-08	=	[	3.7E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	3.97E-11	=	[	1.0E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Aldrin	2.20E-10	=	[	5.6E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.12E-02	=	[	2.2E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	1.47E-06	=	[	5.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	4.29E-05	=	[	1.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	6.47E-04	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	1.31E-06	=	[	4.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Boron	2.76E-05	=	[	1.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	2.69E-05	=	[	9.8E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	1.42E-04	=	[	5.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	7.28E-05	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.36E-04	=	[	5.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.22E-05	=	[	4.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	2.00E-01	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	7.53E-05	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	4.08E-03	=	[	1.5E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.91E-07	=	[	7.0E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	1.02E-04	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	4.14E-05	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	1.16E-05	=	[	4.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Selenium	4.62E-06	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	7.01E-07	=	[	2.6E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	2.86E-04	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	6.83E-06	=	[	2.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	4.85E-04	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.70E-04	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Acetone	5.45E-08	=	[	2.0E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	1.02E-06	=	[	3.7E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	2.78E-09	=	[	1.0E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Aldrin	1.54E-08	=	[	5.6E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.59E-09	=	[	5.20E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	5.41E-11	=	[	3.26E+00	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.06E-10	=	[	1.24E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Aldrin	3.32E-12	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.81E-07	=	[	5.20E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	3.79E-09	=	[	3.26E+00	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	1.44E-08	=	[	1.24E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Aldrin	2.32E-10	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.11E-05	x	0.00E+00	=	0.00E+00	2.88E-03	/	1.00E+00	=	2.88E-03
Antimony	9.85E-10	x	0.00E+00	=	0.00E+00	6.90E-08	/	4.00E-04	=	1.72E-04
Arsenic	2.88E-08	x	1.50E+00	=	4.32E-08	2.01E-06	/	3.00E-04	=	6.72E-03
Barium	4.34E-07	x	0.00E+00	=	0.00E+00	3.04E-05	/	2.00E-01	=	1.52E-04
Beryllium	8.80E-10	x	0.00E+00	=	0.00E+00	6.16E-08	/	2.00E-03	=	3.08E-05
Boron	1.85E-08	x	0.00E+00	=	0.00E+00	1.29E-06	/	2.00E-01	=	6.47E-06
Cadmium	1.80E-08	x	0.00E+00	=	0.00E+00	1.26E-06	/	1.00E-03	=	1.26E-03
Chromium	9.52E-08	x	0.00E+00	=	0.00E+00	6.66E-06	/	3.00E-03	=	2.22E-03
Cobalt	4.88E-08	x	0.00E+00	=	0.00E+00	3.42E-06	/	3.00E-04	=	1.14E-02
Copper	9.13E-08	x	0.00E+00	=	0.00E+00	6.39E-06	/	4.00E-02	=	1.60E-04
Fluoride	8.19E-09	x	0.00E+00	=	0.00E+00	5.73E-07	/	4.00E-02	=	1.43E-05
Iron	1.34E-04	x	0.00E+00	=	0.00E+00	9.38E-03	/	7.00E-01	=	1.34E-02
Lithium	5.05E-08	x	0.00E+00	=	0.00E+00	3.54E-06	/	2.00E-03	=	1.77E-03
Manganese	2.74E-06	x	0.00E+00	=	0.00E+00	1.92E-04	/	1.40E-01	=	1.37E-03
Mercury	1.28E-10	x	0.00E+00	=	0.00E+00	8.99E-09	/	0.00E+00	=	NA
Nickel	6.86E-08	x	0.00E+00	=	0.00E+00	4.80E-06	/	2.00E-02	=	2.40E-04
Nitrate	2.78E-08	x	0.00E+00	=	0.00E+00	1.95E-06	/	1.60E+00	=	1.22E-06
Nitrite	7.75E-09	x	0.00E+00	=	0.00E+00	5.42E-07	/	1.00E-01	=	5.42E-06
Selenium	3.10E-09	x	0.00E+00	=	0.00E+00	2.17E-07	/	5.00E-03	=	4.34E-05
Silver	4.71E-10	x	0.00E+00	=	0.00E+00	3.29E-08	/	5.00E-03	=	6.59E-06
Strontium	1.92E-07	x	0.00E+00	=	0.00E+00	1.34E-05	/	6.00E-01	=	2.24E-05
Total Uranium	4.58E-09	x	0.00E+00	=	0.00E+00	3.21E-07	/	3.00E-03	=	1.07E-04
Vanadium	3.25E-07	x	0.00E+00	=	0.00E+00	2.28E-05	/	5.00E-03	=	4.56E-03
Zinc	2.48E-07	x	0.00E+00	=	0.00E+00	1.74E-05	/	3.00E-01	=	5.79E-05
Acetone	3.67E-11	x	0.00E+00	=	0.00E+00	2.57E-09	/	9.00E-01	=	2.85E-09
Butylbenzylphthalate	6.86E-10	x	1.90E-03	=	1.30E-12	4.80E-08	/	2.00E-01	=	2.40E-07
Toluene	1.87E-12	x	0.00E+00	=	0.00E+00	1.31E-10	/	8.00E-02	=	1.63E-09
Aldrin	1.11E-11	x	1.70E+01	=	1.88E-10	7.75E-10	/	3.00E-05	=	2.58E-05
			Pathway total	=	4.34E-08			Pathway total	=	4.66E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.75E-04	x		=	NA	6.12E-02	/[	5.00E-03	x	1000	]=	1.22E-02
Antimony	2.10E-08	x		=	NA	1.47E-06	/[		x	1000	]=	NA
Arsenic	6.13E-07	x	4.30E-03	=	2.64E-09	4.29E-05	/[	1.50E-05	x	1000	]=	2.86E-03
Barium	9.24E-06	x		=	NA	6.47E-04	/[	5.00E-04	x	1000	]=	1.29E-03
Beryllium	1.87E-08	x	2.40E-03	=	4.50E-11	1.31E-06	/[	2.00E-05	x	1000	]=	6.56E-05
Boron	3.94E-07	x	0.00E+00	=	0.00E+00	2.76E-05	/[	2.00E-02	x	1000	]=	1.38E-06
Cadmium	3.84E-07	x	1.80E-03	=	6.92E-10	2.69E-05	/[	1.00E-05	x	1001	]=	2.69E-03
Chromium	2.03E-06	x	8.40E-02	=	1.70E-07	1.42E-04	/[	1.00E-04	x	1002	]=	1.42E-03
Cobalt	1.04E-06	x	9.00E-03	=	9.36E-09	7.28E-05	/[	6.00E-06	x	1003	]=	1.21E-02
Copper	1.95E-06	x		=	NA	1.36E-04	/[		x	1004	]=	NA
Fluoride	1.74E-07	x		=	NA	1.22E-05	/[	1.30E-02	x	1005	]=	9.35E-07
Iron	2.85E-03	x		=	NA	2.00E-01	/[		x	1000	]=	NA
Lithium	1.08E-06	x		=	NA	7.53E-05	/[		x	1000	]=	NA
Manganese	5.84E-05	x		=	NA	4.08E-03	/[	5.00E-05	x	1000	]=	8.17E-02
Mercury	2.74E-09	x	0.00E+00	=	0.00E+00	1.91E-07	/[	3.00E-04	x	1000	]=	6.38E-07
Nickel	1.46E-06	x	2.60E-04	=	3.80E-10	1.02E-04	/[	9.00E-05	x	1000	]=	1.14E-03
Nitrate	5.92E-07	x		=	NA	4.14E-05	/[		x	1000	]=	NA
Nitrite	1.65E-07	x		=	NA	1.16E-05	/[		x	1000	]=	NA
Selenium	6.60E-08	x	0.00E+00	=	0.00E+00	4.62E-06	/[	2.00E-02	x	1000	]=	2.31E-07
Silver	1.00E-08	x		=	NA	7.01E-07	/[		x	1000	]=	NA
Strontium	4.09E-06	x		=	NA	2.86E-04	/[		x	1000	]=	NA
Total Uranium	9.75E-08	x		=	NA	6.83E-06	/[	4.00E-05	x	1000	]=	1.71E-04
Vanadium	6.93E-06	x		=	NA	4.85E-04	/[	1.00E-04	x	1000	]=	4.85E-03
Zinc	5.28E-06	x		=	NA	3.70E-04	/[		x	1000	]=	NA
Acetone	7.78E-10	x	0.00E+00	=	0.00E+00	5.45E-08	/[	3.10E+01	x	1000	]=	1.76E-12
Butylbenzylphthalate	1.46E-08	x	0.00E+00	=	0.00E+00	1.02E-06	/[		x	1000	]=	NA
Toluene	3.97E-11	x	0.00E+00	=	0.00E+00	2.78E-09	/[	5.00E+00	x	1000	]=	5.56E-13
Aldrin	2.20E-10	x	4.90E-03	=	1.08E-12	1.54E-08	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.83E-07					Pathway total =		1.21E-01

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.59E-09	x	1.50E+00	=	3.89E-09	1.81E-07	/	3.00E-04	=	6.04E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	5.41E-11	x		=	NA	3.79E-09	/	2.50E-05	=	1.52E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	2.06E-10	x	1.90E-03	=	3.91E-13	1.44E-08	/	2.00E-01	=	7.21E-08
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	3.32E-12	x	1.70E+01	=	5.65E-11	2.32E-10	/	3.00E-05	=	7.75E-06
			Pathway total =		3.94E-09			Pathway total =		7.64E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Arsenic	Sum of all pathways	=	4.97E-08	Sum of all pathways	=	1.0E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Beryllium	Sum of all pathways	=	4.50E-11	Sum of all pathways	=	9.6E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-06
Cadmium	Sum of all pathways	=	6.92E-10	Sum of all pathways	=	4.1E-03
Chromium	Sum of all pathways	=	1.70E-07	Sum of all pathways	=	3.6E-03
Cobalt	Sum of all pathways	=	9.36E-09	Sum of all pathways	=	2.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-07
Nickel	Sum of all pathways	=	3.80E-10	Sum of all pathways	=	1.4E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-09
Butylbenzylphthalate	Sum of all pathways	=	1.70E-12	Sum of all pathways	=	3.1E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-09
Aldrin	Sum of all pathways	=	2.46E-10	Sum of all pathways	=	3.4E-05

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2E-07	All Pathways and Chemicals	=	1.68E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.74E-05	=	[	6.76E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.37E-09	=	[	2.47E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.93E-08	=	[	3.49E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	5.21E-07	=	[	9.41E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	1.65E-09	=	[	2.98E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	6.45E-10	=	[	1.17E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	4.97E-08	=	[	8.98E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	4.53E-08	=	[	8.18E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	7.21E-08	=	[	1.30E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.17E-08	=	[	2.11E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.33E-04	=	[	2.39E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	4.11E-08	=	[	7.43E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.14E-06	=	[	3.86E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	1.68E-10	=	[	3.04E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	6.23E-08	=	[	1.13E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	3.96E-08	=	[	7.15E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	1.69E-08	=	[	3.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	4.53E-10	=	[	8.18E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	2.00E-07	=	[	3.62E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Tin	3.52E-08	=	[	6.36E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.96E-09	=	[	7.15E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.86E-07	=	[	6.97E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.12E-07	=	[	3.83E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
2-Butanone	1.38E-11	=	[	2.48E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.23E-08	=	[	4.03E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.28E-10	=	[	5.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Hexane	1.99E-10	=	[	3.59E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	1.11E-11	=	[	2.00E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
o-Xylene	7.09E-13	=	[	1.28E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	3.62E-12	=	[	6.54E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	5.41E-12	=	[	9.78E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Xylenes (total)	2.56E-12	=	[	4.63E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	1.40E-10	=	[	2.52E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	2.82E-11	=	[	5.10E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1260	1.14E-10	=	[	2.06E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.62E-03	=	[	6.76E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	9.58E-08	=	[	2.47E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.35E-06	=	[	3.49E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.65E-05	=	[	9.41E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	1.15E-07	=	[	2.98E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	4.52E-08	=	[	1.17E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	3.48E-06	=	[	8.98E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.17E-06	=	[	8.18E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	5.05E-06	=	[	1.30E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	8.18E-07	=	[	2.11E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	9.28E-03	=	[	2.39E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	2.88E-06	=	[	7.43E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.50E-04	=	[	3.86E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	1.18E-08	=	[	3.04E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	4.36E-06	=	[	1.13E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	2.77E-06	=	[	7.15E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	1.19E-06	=	[	3.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	3.17E-08	=	[	8.18E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.40E-05	=	[	3.62E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Tin	2.46E-06	=	[	6.36E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.77E-07	=	[	7.15E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.70E-05	=	[	6.97E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.49E-05	=	[	3.83E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
2-Butanone	9.63E-10	=	[	2.48E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	1.56E-06	=	[	4.03E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	2.30E-08	=	[	5.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Hexane	1.39E-08	=	[	3.59E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	7.75E-10	=	[	2.00E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
o-Xylene	4.96E-11	=	[	1.28E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Styrene	2.53E-10	=	[	6.54E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	3.79E-10	=	[	9.78E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Xylenes (total)	1.79E-10	=	[	4.63E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	9.78E-09	=	[	2.52E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Gamma-BHC (Lindane)	1.98E-09	=	[	5.10E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1260	7.98E-09	=	[	2.06E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.97E-04	=	[	2.0E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	2.91E-08	=	[	7.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	4.11E-07	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	1.11E-05	=	[	2.8E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	3.51E-08	=	[	9.0E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.37E-08	=	[	3.5E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.06E-06	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	9.65E-07	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.54E-06	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	2.49E-07	=	[	6.4E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.82E-03	=	[	7.2E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	8.76E-07	=	[	2.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.55E-05	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	3.58E-09	=	[	9.2E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.33E-06	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	8.43E-07	=	[	2.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	3.61E-07	=	[	9.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	9.64E-09	=	[	2.5E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	4.27E-06	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Tin	7.50E-07	=	[	1.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	8.43E-08	=	[	2.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	8.22E-06	=	[	2.1E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	4.52E-06	=	[	1.2E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
2-Butanone	2.92E-10	=	[	7.5E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	4.75E-07	=	[	1.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.98E-09	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Hexane	4.23E-09	=	[	1.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Methylene chloride	2.36E-10	=	[	6.0E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
o-Xylene	1.51E-11	=	[	3.9E-08	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Styrene	7.70E-11	=	[	2.0E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	1.15E-10	=	[	2.9E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.45E-11	=	[	1.4E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
beta-BHC	2.98E-09	=	[	7.6E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	6.01E-10	=	[	1.5E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.43E-09	=	[	6.2E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	5.58E-02	=	[	2.0E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.04E-06	=	[	7.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	2.88E-05	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	7.77E-04	=	[	2.8E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	2.46E-06	=	[	9.0E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	9.62E-07	=	[	3.5E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	7.41E-05	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	6.75E-05	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.08E-04	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.74E-05	=	[	6.4E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	1.98E-01	=	[	7.2E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	6.13E-05	=	[	2.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.19E-03	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	2.51E-07	=	[	9.2E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	9.29E-05	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	5.90E-05	=	[	2.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	2.52E-05	=	[	9.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	6.75E-07	=	[	2.5E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	2.99E-04	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Tin	5.25E-05	=	[	1.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	5.90E-06	=	[	2.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	5.76E-04	=	[	2.1E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.16E-04	=	[	1.2E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
2-Butanone	2.04E-08	=	[	7.5E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Bis(2-ethylhexyl) phthalate	3.33E-05	=	[	1.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	4.89E-07	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Hexane	2.96E-07	=	[	1.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Methylene chloride	1.65E-08	=	[	6.0E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
o-Xylene	1.06E-09	=	[	3.9E-08	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Styrene	5.39E-09	=	[	2.0E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	8.07E-09	=	[	2.9E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Xylenes (total)	3.82E-09	=	[	1.4E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
beta-BHC	2.08E-07	=	[	7.6E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Gamma-BHC (Lindane)	4.21E-08	=	[	1.5E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Aroclor-1260	1.70E-07	=	[	6.2E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.74E-09	=	[	3.49E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00			2.98E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.94E-12			1.17E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA			8.98E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA			8.18E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA			1.30E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA			2.11E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA			2.39E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA			7.43E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA			3.86E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00			3.04E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA			1.13E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA			7.15E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.70E-09	=	[	4.03E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	9.84E-11	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	4.19E-11	=	[	2.52E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	3.39E-12	=	[	5.10E-03	x	1.00E-06	x	3,300	x	0.3	x	0.04	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1260	4.79E-11	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.22E-07	=	[	3.49E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.35E-10	=	[	1.17E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	4.69E-07	=	[	4.03E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	6.89E-09	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	2.93E-09	=	[	2.52E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Gamma-BHC (Lindane)	2.37E-10	=	[	5.10E-03	x	1.00E-06	x	3,300	x	0.3	x	0.04	x	1	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1260	3.35E-09	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.74E-05	x	0.00E+00	=	0.00E+00	2.62E-03	/	1.00E+00	=	2.62E-03
Antimony	1.37E-09	x	0.00E+00	=	0.00E+00	9.58E-08	/	4.00E-04	=	2.39E-04
Arsenic	1.93E-08	x	1.50E+00	=	2.90E-08	1.35E-06	/	3.00E-04	=	4.50E-03
Barium	5.21E-07	x	0.00E+00	=	0.00E+00	3.65E-05	/	2.00E-01	=	1.82E-04
Beryllium	1.65E-09	x	0.00E+00	=	0.00E+00	1.15E-07	/	2.00E-03	=	5.77E-05
Cadmium	6.45E-10	x	0.00E+00	=	0.00E+00	4.52E-08	/	1.00E-03	=	4.52E-05
Chromium	4.97E-08	x	0.00E+00	=	0.00E+00	3.48E-06	/	3.00E-03	=	1.16E-03
Cobalt	4.53E-08	x	0.00E+00	=	0.00E+00	3.17E-06	/	3.00E-04	=	1.06E-02
Copper	7.21E-08	x	0.00E+00	=	0.00E+00	5.05E-06	/	4.00E-02	=	1.26E-04
Fluoride	1.17E-08	x	0.00E+00	=	0.00E+00	8.18E-07	/	4.00E-02	=	2.05E-05
Iron	1.33E-04	x	0.00E+00	=	0.00E+00	9.28E-03	/	7.00E-01	=	1.33E-02
Lithium	4.11E-08	x	0.00E+00	=	0.00E+00	2.88E-06	/	2.00E-03	=	1.44E-03
Manganese	2.14E-06	x	0.00E+00	=	0.00E+00	1.50E-04	/	1.40E-01	=	1.07E-03
Mercury	1.68E-10	x	0.00E+00	=	0.00E+00	1.18E-08	/	0.00E+00	=	NA
Nickel	6.23E-08	x	0.00E+00	=	0.00E+00	4.36E-06	/	2.00E-02	=	2.18E-04
Nitrate	3.96E-08	x	0.00E+00	=	0.00E+00	2.77E-06	/	1.60E+00	=	1.73E-06
Nitrite	1.69E-08	x	0.00E+00	=	0.00E+00	1.19E-06	/	1.00E-01	=	1.19E-05
Silver	4.53E-10	x	0.00E+00	=	0.00E+00	3.17E-08	/	5.00E-03	=	6.34E-06
Strontium	2.00E-07	x	0.00E+00	=	0.00E+00	1.40E-05	/	6.00E-01	=	2.34E-05
Tin	3.52E-08	x	0.00E+00	=	0.00E+00	2.46E-06	/	6.00E-01	=	4.11E-06
Total Uranium	3.96E-09	x	0.00E+00	=	0.00E+00	2.77E-07	/	3.00E-03	=	9.24E-05
Vanadium	3.86E-07	x	0.00E+00	=	0.00E+00	2.70E-05	/	5.00E-03	=	5.40E-03
Zinc	2.12E-07	x	0.00E+00	=	0.00E+00	1.49E-05	/	3.00E-01	=	4.95E-05
2-Butanone	1.38E-11	x	0.00E+00	=	0.00E+00	9.63E-10	/	6.00E-01	=	1.60E-09
Bis(2-ethylhexyl) phthalate	2.23E-08	x	1.40E-02	=	3.12E-10	1.56E-06	/	2.00E-02	=	7.81E-05
Butylbenzylphthalate	3.28E-10	x	1.90E-03	=	6.23E-13	2.30E-08	/	2.00E-01	=	1.15E-07
Hexane	1.99E-10	x	0.00E+00	=	0.00E+00	1.39E-08	/	6.00E-02	=	2.32E-07
Methylene chloride	1.11E-11	x	2.00E-03	=	2.21E-14	7.75E-10	/	6.00E-03	=	1.29E-07
o-Xylene	7.09E-13	x	0.00E+00	=	0.00E+00	4.96E-11	/	2.00E-01	=	2.48E-10
Styrene	3.62E-12	x	0.00E+00	=	0.00E+00	2.53E-10	/	2.00E-01	=	1.27E-09
Toluene	5.41E-12	x	0.00E+00	=	0.00E+00	3.79E-10	/	8.00E-02	=	4.74E-09
Xylenes (total)	2.56E-12	x	0.00E+00	=	0.00E+00	1.79E-10	/	2.00E-01	=	8.97E-10
beta-BHC	1.40E-10	x	1.80E+00	=	2.51E-10	9.78E-09	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	2.82E-11	x	1.10E+00	=	3.11E-11	1.98E-09	/	3.00E-04	=	6.59E-06
Aroclor-1260	1.14E-10	x	2.00E+00	=	2.28E-10	7.98E-09	/	0.00E+00	=	NA
			Pathway total	=	2.98E-08			Pathway total	=	4.12E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.97E-04	x		=	NA	5.58E-02	/[	5.00E-03	x	1000	]=	1.12E-02
Antimony	2.91E-08	x		=	NA	2.04E-06	/[		x	1000	]=	NA
Arsenic	4.11E-07	x	4.30E-03	=	1.77E-09	2.88E-05	/[	1.50E-05	x	1000	]=	1.92E-03
Barium	1.11E-05	x		=	NA	7.77E-04	/[	5.00E-04	x	1000	]=	1.55E-03
Beryllium	3.51E-08	x	2.40E-03	=	8.43E-11	2.46E-06	/[	2.00E-05	x	1000	]=	1.23E-04
Cadmium	1.37E-08	x	1.80E-03	=	2.47E-11	9.62E-07	/[	1.00E-05	x	1000	]=	9.62E-05
Chromium	1.06E-06	x	8.40E-02	=	8.89E-08	7.41E-05	/[	1.00E-04	x	1000	]=	7.41E-04
Cobalt	9.65E-07	x	9.00E-03	=	8.68E-09	6.75E-05	/[	6.00E-06	x	1000	]=	1.13E-02
Copper	1.54E-06	x		=	NA	1.08E-04	/[		x	1000	]=	NA
Fluoride	2.49E-07	x		=	NA	1.74E-05	/[	1.30E-02	x	1000	]=	1.34E-06
Iron	2.82E-03	x		=	NA	1.98E-01	/[		x	1000	]=	NA
Lithium	8.76E-07	x		=	NA	6.13E-05	/[		x	1000	]=	NA
Manganese	4.55E-05	x		=	NA	3.19E-03	/[	5.00E-05	x	1000	]=	6.38E-02
Mercury	3.58E-09	x	0.00E+00	=	0.00E+00	2.51E-07	/[	3.00E-04	x	1000	]=	8.36E-07
Nickel	1.33E-06	x	2.60E-04	=	3.45E-10	9.29E-05	/[	9.00E-05	x	1000	]=	1.03E-03
Nitrate	8.43E-07	x		=	NA	5.90E-05	/[		x	1000	]=	NA
Nitrite	3.61E-07	x		=	NA	2.52E-05	/[		x	1000	]=	NA
Silver	9.64E-09	x		=	NA	6.75E-07	/[		x	1000	]=	NA
Strontium	4.27E-06	x		=	NA	2.99E-04	/[		x	1000	]=	NA
Tin	7.50E-07	x		=	NA	5.25E-05	/[		x	1000	]=	NA
Total Uranium	8.43E-08	x		=	NA	5.90E-06	/[	4.00E-05	x	1000	]=	1.48E-04
Vanadium	8.22E-06	x		=	NA	5.76E-04	/[	1.00E-04	x	1000	]=	5.76E-03
Zinc	4.52E-06	x		=	NA	3.16E-04	/[		x	1000	]=	NA
2-Butanone	2.92E-10	x	0.00E+00	=	0.00E+00	2.04E-08	/[	5.00E+00	x	1000	]=	4.09E-12
Bis(2-ethylhexyl) phthalate	4.75E-07	x	2.40E-06	=	1.14E-12	3.33E-05	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.98E-09	x	0.00E+00	=	0.00E+00	4.89E-07	/[		x	1000	]=	NA
Hexane	4.23E-09	x	0.00E+00	=	0.00E+00	2.96E-07	/[	7.00E-01	x	1000	]=	4.23E-10
Methylene chloride	2.36E-10	x	1.00E-08	=	2.36E-18	1.65E-08	/[	6.00E-01	x	1000	]=	2.75E-11
o-Xylene	1.51E-11	x	0.00E+00	=	0.00E+00	1.06E-09	/[	1.00E-01	x	1000	]=	1.06E-11
Styrene	7.70E-11	x	0.00E+00	=	0.00E+00	5.39E-09	/[	1.00E+00	x	1000	]=	5.39E-12
Toluene	1.15E-10	x	0.00E+00	=	0.00E+00	8.07E-09	/[	5.00E+00	x	1000	]=	1.61E-12
Xylenes (total)	5.45E-11	x	0.00E+00	=	0.00E+00	3.82E-09	/[	1.00E-01	x	1000	]=	3.82E-11
beta-BHC	2.98E-09	x	5.30E-04	=	1.58E-12	2.08E-07	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	6.01E-10	x	3.10E-04	=	1.86E-13	4.21E-08	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.43E-09	x	5.70E-04	=	1.38E-12	1.70E-07	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.98E-08					Pathway total =		9.75E-02

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.74E-09	x	1.50E+00	=	2.61E-09	1.22E-07	/	3.00E-04	=	4.05E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.94E-12	x		=	NA	1.35E-10	/	2.50E-05	=	5.42E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	6.70E-09	x	1.40E-02	=	9.37E-11	4.69E-07	/	2.00E-02	=	2.34E-05
Butylbenzylphthalate	9.84E-11	x	1.90E-03	=	1.87E-13	6.89E-09	/	2.00E-01	=	3.44E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	4.19E-11	x	1.80E+00	=	7.54E-11	2.93E-09	/		=	NA
Gamma-BHC (Lindane)	3.39E-12	x	1.10E+00	=	3.73E-12	2.37E-10	/	3.00E-04	=	7.90E-07
Aroclor-1260	4.79E-11	x	2.00E+00	=	9.58E-11	3.35E-09	/		=	NA
			Pathway total =		2.88E-09			Pathway total =		4.35E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Arsenic	Sum of all pathways	=	3.33E-08	Sum of all pathways	=	6.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Beryllium	Sum of all pathways	=	8.43E-11	Sum of all pathways	=	1.8E-04
Cadmium	Sum of all pathways	=	2.47E-11	Sum of all pathways	=	1.5E-04
Chromium	Sum of all pathways	=	8.89E-08	Sum of all pathways	=	1.9E-03
Cobalt	Sum of all pathways	=	8.68E-09	Sum of all pathways	=	2.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-07
Nickel	Sum of all pathways	=	3.45E-10	Sum of all pathways	=	1.2E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-05
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	4.07E-10	Sum of all pathways	=	1.0E-04
Butylbenzylphthalate	Sum of all pathways	=	8.10E-13	Sum of all pathways	=	1.5E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-07
Methylene chloride	Sum of all pathways	=	2.21E-14	Sum of all pathways	=	1.3E-07
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-10
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-09
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-10
beta-BHC	Sum of all pathways	=	3.29E-10	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	3.50E-11	Sum of all pathways	=	7.4E-06
Aroclor-1260	Sum of all pathways	=	3.25E-10	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1E-07	All Pathways and Chemicals	=	1.39E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.88E-05	=	[	7.01E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.42E-09	=	[	2.56E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.78E-08	=	[	5.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	5.01E-07	=	[	9.05E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	1.10E-09	=	[	1.99E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	7.61E-10	=	[	1.37E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	9.30E-08	=	[	1.68E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	5.64E-08	=	[	1.02E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	6.75E-08	=	[	1.22E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	9.17E-09	=	[	1.66E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.44E-04	=	[	2.61E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	4.19E-08	=	[	7.56E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.26E-06	=	[	4.08E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	1.11E-08	=	[	2.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	7.24E-08	=	[	1.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	1.80E-07	=	[	3.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	7.19E-09	=	[	1.30E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	5.44E-09	=	[	9.83E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	3.62E-10	=	[	6.55E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	1.85E-07	=	[	3.34E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.02E-09	=	[	5.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.66E-07	=	[	6.61E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.48E-07	=	[	4.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.11E-09	=	[	2.00E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Di-n-butylphthalate	3.16E-09	=	[	5.70E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	2.18E-12	=	[	3.94E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	3.42E-12	=	[	6.18E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.71E-03	=	[	7.01E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	9.91E-08	=	[	2.56E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.94E-06	=	[	5.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.51E-05	=	[	9.05E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	7.70E-08	=	[	1.99E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	5.33E-08	=	[	1.37E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	6.51E-06	=	[	1.68E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.94E-06	=	[	1.02E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	4.72E-06	=	[	1.22E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	6.42E-07	=	[	1.66E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	1.01E-02	=	[	2.61E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	2.93E-06	=	[	7.56E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.58E-04	=	[	4.08E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	7.75E-07	=	[	2.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	5.07E-06	=	[	1.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	1.26E-05	=	[	3.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	5.04E-07	=	[	1.30E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Selenium	3.81E-07	=	[	9.83E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	2.54E-08	=	[	6.55E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.29E-05	=	[	3.34E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.11E-07	=	[	5.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.56E-05	=	[	6.61E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.74E-05	=	[	4.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	7.75E-08	=	[	2.00E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Di-n-butylphthalate	2.21E-07	=	[	5.70E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Styrene	1.53E-10	=	[	3.94E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	2.40E-10	=	[	6.18E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.26E-04	=	[	2.1E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	3.02E-08	=	[	7.7E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	5.92E-07	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	1.07E-05	=	[	2.7E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	2.34E-08	=	[	6.0E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.62E-08	=	[	4.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.98E-06	=	[	5.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.20E-06	=	[	3.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.44E-06	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	1.95E-07	=	[	5.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	3.08E-03	=	[	7.9E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	8.92E-07	=	[	2.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.81E-05	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Molybdenum	2.36E-07	=	[	6.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.54E-06	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	3.82E-06	=	[	9.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	1.53E-07	=	[	3.9E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Selenium	1.16E-07	=	[	3.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	7.72E-09	=	[	2.0E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	3.94E-06	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	6.43E-08	=	[	1.6E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	7.80E-06	=	[	2.0E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	5.28E-06	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.36E-08	=	[	6.0E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	6.72E-08	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Styrene	4.63E-11	=	[	1.2E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	7.28E-11	=	[	1.9E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	5.78E-02	=	[	2.1E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.11E-06	=	[	7.7E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	4.14E-05	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	7.47E-04	=	[	2.7E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	1.64E-06	=	[	6.0E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	1.13E-06	=	[	4.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	1.39E-04	=	[	5.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	8.40E-05	=	[	3.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.01E-04	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.37E-05	=	[	5.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	2.15E-01	=	[	7.9E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	6.24E-05	=	[	2.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.37E-03	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Molybdenum	1.65E-05	=	[	6.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	1.08E-04	=	[	3.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	2.68E-04	=	[	9.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	1.07E-05	=	[	3.9E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Selenium	8.11E-06	=	[	3.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	5.40E-07	=	[	2.0E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	2.76E-04	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	4.50E-06	=	[	1.6E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	5.46E-04	=	[	2.0E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.70E-04	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	1.65E-06	=	[	6.0E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Di-n-butylphthalate	4.70E-06	=	[	1.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Styrene	3.24E-09	=	[	1.2E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	5.10E-09	=	[	1.9E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.50E-09	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	2.28E-12	=	[	1.37E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.32E-10	=	[	2.00E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Di-n-butylphthalate	9.47E-10	=	[	5.70E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.75E-07	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.60E-10	=	[	1.37E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	2.32E-08	=	[	2.00E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Di-n-butylphthalate	6.63E-08	=	[	5.70E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.88E-05	x	0.00E+00	=	0.00E+00	2.71E-03	/	1.00E+00	=	2.71E-03
Antimony	1.42E-09	x	0.00E+00	=	0.00E+00	9.91E-08	/	4.00E-04	=	2.48E-04
Arsenic	2.78E-08	x	1.50E+00	=	4.17E-08	1.94E-06	/	3.00E-04	=	6.48E-03
Barium	5.01E-07	x	0.00E+00	=	0.00E+00	3.51E-05	/	2.00E-01	=	1.75E-04
Beryllium	1.10E-09	x	0.00E+00	=	0.00E+00	7.70E-08	/	2.00E-03	=	3.85E-05
Cadmium	7.61E-10	x	0.00E+00	=	0.00E+00	5.33E-08	/	1.00E-03	=	5.33E-05
Chromium	9.30E-08	x	0.00E+00	=	0.00E+00	6.51E-06	/	3.00E-03	=	2.17E-03
Cobalt	5.64E-08	x	0.00E+00	=	0.00E+00	3.94E-06	/	3.00E-04	=	1.31E-02
Copper	6.75E-08	x	0.00E+00	=	0.00E+00	4.72E-06	/	4.00E-02	=	1.18E-04
Fluoride	9.17E-09	x	0.00E+00	=	0.00E+00	6.42E-07	/	4.00E-02	=	1.61E-05
Iron	1.44E-04	x	0.00E+00	=	0.00E+00	1.01E-02	/	7.00E-01	=	1.44E-02
Lithium	4.19E-08	x	0.00E+00	=	0.00E+00	2.93E-06	/	2.00E-03	=	1.47E-03
Manganese	2.26E-06	x	0.00E+00	=	0.00E+00	1.58E-04	/	1.40E-01	=	1.13E-03
Molybdenum	1.11E-08	x	0.00E+00	=	0.00E+00	7.75E-07	/	5.00E-03	=	1.55E-04
Nickel	7.24E-08	x	0.00E+00	=	0.00E+00	5.07E-06	/	2.00E-02	=	2.53E-04
Nitrate	1.80E-07	x	0.00E+00	=	0.00E+00	1.26E-05	/	1.60E+00	=	7.86E-06
Nitrite	7.19E-09	x	0.00E+00	=	0.00E+00	5.04E-07	/	1.00E-01	=	5.04E-06
Selenium	5.44E-09	x	0.00E+00	=	0.00E+00	3.81E-07	/	5.00E-03	=	7.61E-05
Silver	3.62E-10	x	0.00E+00	=	0.00E+00	2.54E-08	/	5.00E-03	=	5.07E-06
Strontium	1.85E-07	x	0.00E+00	=	0.00E+00	1.29E-05	/	6.00E-01	=	2.16E-05
Total Uranium	3.02E-09	x	0.00E+00	=	0.00E+00	2.11E-07	/	3.00E-03	=	7.04E-05
Vanadium	3.66E-07	x	0.00E+00	=	0.00E+00	2.56E-05	/	5.00E-03	=	5.13E-03
Zinc	2.48E-07	x	0.00E+00	=	0.00E+00	1.74E-05	/	3.00E-01	=	5.78E-05
Butylbenzylphthalate	1.11E-09	x	1.90E-03	=	2.10E-12	7.75E-08	/	2.00E-01	=	3.87E-07
Di-n-butylphthalate	3.16E-09	x	0.00E+00	=	0.00E+00	2.21E-07	/	1.00E-01	=	2.21E-06
Styrene	2.18E-12	x	0.00E+00	=	0.00E+00	1.53E-10	/	2.00E-01	=	7.63E-10
Toluene	3.42E-12	x	0.00E+00	=	0.00E+00	2.40E-10	/	8.00E-02	=	2.99E-09
			Pathway total	=	4.17E-08			Pathway total	=	4.80E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.26E-04	x		=	NA	5.78E-02	/[	5.00E-03	x	1000	]=	1.16E-02
Antimony	3.02E-08	x		=	NA	2.11E-06	/[		x	1000	]=	NA
Arsenic	5.92E-07	x	4.30E-03	=	2.54E-09	4.14E-05	/[	1.50E-05	x	1000	]=	2.76E-03
Barium	1.07E-05	x		=	NA	7.47E-04	/[	5.00E-04	x	1000	]=	1.49E-03
Beryllium	2.34E-08	x	2.40E-03	=	5.62E-11	1.64E-06	/[	2.00E-05	x	1000	]=	8.20E-05
Cadmium	1.62E-08	x	1.80E-03	=	2.92E-11	1.13E-06	/[	1.00E-05	x	1000	]=	1.13E-04
Chromium	1.98E-06	x	8.40E-02	=	1.66E-07	1.39E-04	/[	1.00E-04	x	1000	]=	1.39E-03
Cobalt	1.20E-06	x	9.00E-03	=	1.08E-08	8.40E-05	/[	6.00E-06	x	1000	]=	1.40E-02
Copper	1.44E-06	x		=	NA	1.01E-04	/[		x	1000	]=	NA
Fluoride	1.95E-07	x		=	NA	1.37E-05	/[	1.30E-02	x	1000	]=	1.05E-06
Iron	3.08E-03	x		=	NA	2.15E-01	/[		x	1000	]=	NA
Lithium	8.92E-07	x		=	NA	6.24E-05	/[		x	1000	]=	NA
Manganese	4.81E-05	x		=	NA	3.37E-03	/[	5.00E-05	x	1000	]=	6.73E-02
Molybdenum	2.36E-07	x	0.00E+00	=	0.00E+00	1.65E-05	/[	0.00E+00	x	1000	]=	NA
Nickel	1.54E-06	x	2.60E-04	=	4.01E-10	1.08E-04	/[	9.00E-05	x	1000	]=	1.20E-03
Nitrate	3.82E-06	x		=	NA	2.68E-04	/[		x	1000	]=	NA
Nitrite	1.53E-07	x		=	NA	1.07E-05	/[		x	1000	]=	NA
Selenium	1.16E-07	x	0.00E+00	=	0.00E+00	8.11E-06	/[	2.00E-02	x	1000	]=	4.05E-07
Silver	7.72E-09	x		=	NA	5.40E-07	/[		x	1000	]=	NA
Strontium	3.94E-06	x		=	NA	2.76E-04	/[		x	1000	]=	NA
Total Uranium	6.43E-08	x		=	NA	4.50E-06	/[	4.00E-05	x	1000	]=	1.13E-04
Vanadium	7.80E-06	x		=	NA	5.46E-04	/[	1.00E-04	x	1000	]=	5.46E-03
Zinc	5.28E-06	x		=	NA	3.70E-04	/[		x	1000	]=	NA
Butylbenzylphthalate	2.36E-08	x	0.00E+00	=	0.00E+00	1.65E-06	/[		x	1000	]=	NA
Di-n-butylphthalate	6.72E-08	x	0.00E+00	=	0.00E+00	4.70E-06	/[	0.00E+00	x	1000	]=	NA
Styrene	4.63E-11	x	0.00E+00	=	0.00E+00	3.24E-09	/[	1.00E+00	x	1000	]=	3.24E-12
Toluene	7.28E-11	x	0.00E+00	=	0.00E+00	5.10E-09	/	5.00E+00	x	1000	]=	1.02E-12
			Pathway total =		1.80E-07					Pathway total =		1.06E-01

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.50E-09	x	1.50E+00	=	3.75E-09	1.75E-07	/	3.00E-04	=	5.83E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.28E-12	x		=	NA	1.60E-10	/	2.50E-05	=	6.39E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	3.32E-10	x	1.90E-03	=	6.31E-13	2.32E-08	/	2.00E-01	=	1.16E-07
Di-n-butylphthalate	9.47E-10	x		=	NA	6.63E-08	/	1.00E-01	=	6.63E-07
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		3.75E-09			Pathway total =		5.91E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Arsenic	Sum of all pathways	=	4.80E-08	Sum of all pathways	=	9.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Beryllium	Sum of all pathways	=	5.62E-11	Sum of all pathways	=	1.2E-04
Cadmium	Sum of all pathways	=	2.92E-11	Sum of all pathways	=	1.7E-04
Chromium	Sum of all pathways	=	1.66E-07	Sum of all pathways	=	3.6E-03
Cobalt	Sum of all pathways	=	1.08E-08	Sum of all pathways	=	2.7E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-02
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Nickel	Sum of all pathways	=	4.01E-10	Sum of all pathways	=	1.5E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-05
Butylbenzylphthalate	Sum of all pathways	=	2.73E-12	Sum of all pathways	=	5.0E-07
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-06
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-09

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2E-07	All Pathways and Chemicals	=	1.54E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.28E-05	=	[	7.74E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.20E-08	=	[	2.16E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	4.37E-08	=	[	7.89E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	1.35E-06	=	[	2.44E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	1.82E-09	=	[	3.28E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Boron	2.43E-07	=	[	4.39E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	6.25E-10	=	[	1.13E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	6.42E-08	=	[	1.16E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	4.58E-08	=	[	8.27E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	7.64E-08	=	[	1.38E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	8.47E-09	=	[	1.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.33E-04	=	[	2.41E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	4.80E-08	=	[	8.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.12E-06	=	[	3.83E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	8.97E-11	=	[	1.62E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	7.58E-08	=	[	1.37E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	5.11E-08	=	[	9.23E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	1.38E-08	=	[	2.50E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	3.45E-10	=	[	6.24E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	6.92E-07	=	[	1.25E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Tin	1.99E-08	=	[	3.60E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.60E-09	=	[	6.50E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.01E-07	=	[	5.43E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.89E-07	=	[	5.23E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.15E-08	=	[	2.07E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.31E-10	=	[	7.78E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.00E-03	=	[	7.74E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	8.37E-07	=	[	2.16E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	3.06E-06	=	[	7.89E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	9.45E-05	=	[	2.44E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	1.27E-07	=	[	3.28E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Boron	1.70E-05	=	[	4.39E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	4.38E-08	=	[	1.13E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	4.49E-06	=	[	1.16E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.20E-06	=	[	8.27E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	5.35E-06	=	[	1.38E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	5.93E-07	=	[	1.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	9.34E-03	=	[	2.41E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.36E-06	=	[	8.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.48E-04	=	[	3.83E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	6.28E-09	=	[	1.62E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	5.31E-06	=	[	1.37E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	3.58E-06	=	[	9.23E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	9.69E-07	=	[	2.50E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	2.42E-08	=	[	6.24E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	4.84E-05	=	[	1.25E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Tin	1.39E-06	=	[	3.60E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.52E-07	=	[	6.50E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.10E-05	=	[	5.43E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	2.03E-05	=	[	5.23E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	8.02E-07	=	[	2.07E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	3.01E-08	=	[	7.78E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.12E-04	=	[	2.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	2.55E-07	=	[	6.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	9.30E-07	=	[	2.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	2.88E-05	=	[	7.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	3.87E-08	=	[	9.9E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Boron	5.18E-06	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.33E-08	=	[	3.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.37E-06	=	[	3.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	9.75E-07	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.63E-06	=	[	4.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	1.80E-07	=	[	4.6E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.84E-03	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	1.02E-06	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.52E-05	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	1.91E-09	=	[	4.9E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.62E-06	=	[	4.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	1.09E-06	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	2.95E-07	=	[	7.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	7.36E-09	=	[	1.9E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	1.47E-05	=	[	3.8E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Tin	4.24E-07	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	7.67E-08	=	[	2.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	6.40E-06	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	6.17E-06	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.44E-07	=	[	6.2E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.17E-09	=	[	2.3E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.39E-02	=	[	2.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	1.78E-05	=	[	6.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	6.51E-05	=	[	2.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	2.01E-03	=	[	7.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	2.71E-06	=	[	9.9E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Boron	3.62E-04	=	[	1.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	9.32E-07	=	[	3.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	9.57E-05	=	[	3.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	6.82E-05	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.14E-04	=	[	4.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.26E-05	=	[	4.6E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	1.99E-01	=	[	7.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	7.16E-05	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.16E-03	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.34E-07	=	[	4.9E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	1.13E-04	=	[	4.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	7.62E-05	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	2.06E-05	=	[	7.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	5.15E-07	=	[	1.9E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	1.03E-03	=	[	3.8E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Tin	2.97E-05	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	5.37E-06	=	[	2.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	4.48E-04	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	4.32E-04	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Bis(2-ethylhexyl) phthalate	1.71E-05	=	[	6.2E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	6.42E-07	=	[	2.3E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	3.93E-09	=	[	7.89E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.88E-12	=	[	1.13E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.44E-09	=	[	2.07E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.29E-10	=	[	7.78E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.75E-07	=	[	7.89E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.31E-10	=	[	1.13E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	2.41E-07	=	[	2.07E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	9.04E-09	=	[	7.78E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.28E-05	x	0.00E+00	=	0.00E+00	3.00E-03	/	1.00E+00	=	3.00E-03
Antimony	1.20E-08	x	0.00E+00	=	0.00E+00	8.37E-07	/	4.00E-04	=	2.09E-03
Arsenic	4.37E-08	x	1.50E+00	=	6.55E-08	3.06E-06	/	3.00E-04	=	1.02E-02
Barium	1.35E-06	x	0.00E+00	=	0.00E+00	9.45E-05	/	2.00E-01	=	4.73E-04
Beryllium	1.82E-09	x	0.00E+00	=	0.00E+00	1.27E-07	/	2.00E-03	=	6.35E-05
Boron	2.43E-07	x	0.00E+00	=	0.00E+00	1.70E-05	/	2.00E-01	=	8.51E-05
Cadmium	6.25E-10	x	0.00E+00	=	0.00E+00	4.38E-08	/	1.00E-03	=	4.38E-05
Chromium	6.42E-08	x	0.00E+00	=	0.00E+00	4.49E-06	/	3.00E-03	=	1.50E-03
Cobalt	4.58E-08	x	0.00E+00	=	0.00E+00	3.20E-06	/	3.00E-04	=	1.07E-02
Copper	7.64E-08	x	0.00E+00	=	0.00E+00	5.35E-06	/	4.00E-02	=	1.34E-04
Fluoride	8.47E-09	x	0.00E+00	=	0.00E+00	5.93E-07	/	4.00E-02	=	1.48E-05
Iron	1.33E-04	x	0.00E+00	=	0.00E+00	9.34E-03	/	7.00E-01	=	1.33E-02
Lithium	4.80E-08	x	0.00E+00	=	0.00E+00	3.36E-06	/	2.00E-03	=	1.68E-03
Manganese	2.12E-06	x	0.00E+00	=	0.00E+00	1.48E-04	/	1.40E-01	=	1.06E-03
Mercury	8.97E-11	x	0.00E+00	=	0.00E+00	6.28E-09	/	0.00E+00	=	NA
Nickel	7.58E-08	x	0.00E+00	=	0.00E+00	5.31E-06	/	2.00E-02	=	2.65E-04
Nitrate	5.11E-08	x	0.00E+00	=	0.00E+00	3.58E-06	/	1.60E+00	=	2.24E-06
Nitrite	1.38E-08	x	0.00E+00	=	0.00E+00	9.69E-07	/	1.00E-01	=	9.69E-06
Silver	3.45E-10	x	0.00E+00	=	0.00E+00	2.42E-08	/	5.00E-03	=	4.84E-06
Strontium	6.92E-07	x	0.00E+00	=	0.00E+00	4.84E-05	/	6.00E-01	=	8.07E-05
Tin	1.99E-08	x	0.00E+00	=	0.00E+00	1.39E-06	/	6.00E-01	=	2.32E-06
Total Uranium	3.60E-09	x	0.00E+00	=	0.00E+00	2.52E-07	/	3.00E-03	=	8.40E-05
Vanadium	3.01E-07	x	0.00E+00	=	0.00E+00	2.10E-05	/	5.00E-03	=	4.21E-03
Zinc	2.89E-07	x	0.00E+00	=	0.00E+00	2.03E-05	/	3.00E-01	=	6.75E-05
Bis(2-ethylhexyl) phthalate	1.15E-08	x	1.40E-02	=	1.60E-10	8.02E-07	/	2.00E-02	=	4.01E-05
Butylbenzylphthalate	4.31E-10	x	1.90E-03	=	8.18E-13	3.01E-08	/	2.00E-01	=	1.51E-07
			Pathway total	=	6.57E-08			Pathway total	=	4.91E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.12E-04	x		=	NA	6.39E-02	/[	5.00E-03	x	1000	]=	1.28E-02
Antimony	2.55E-07	x		=	NA	1.78E-05	/[		x	1000	]=	NA
Arsenic	9.30E-07	x	4.30E-03	=	4.00E-09	6.51E-05	/[	1.50E-05	x	1000	]=	4.34E-03
Barium	2.88E-05	x		=	NA	2.01E-03	/[	5.00E-04	x	1000	]=	4.03E-03
Beryllium	3.87E-08	x	2.40E-03	=	9.28E-11	2.71E-06	/[	2.00E-05	x	1000	]=	1.35E-04
Boron	5.18E-06	x	0.00E+00	=	0.00E+00	3.62E-04	/[	2.00E-02	x	1000	]=	1.81E-05
Cadmium	1.33E-08	x	1.80E-03	=	2.40E-11	9.32E-07	/[	1.00E-05	x	1000	]=	9.32E-05
Chromium	1.37E-06	x	8.40E-02	=	1.15E-07	9.57E-05	/[	1.00E-04	x	1000	]=	9.57E-04
Cobalt	9.75E-07	x	9.00E-03	=	8.77E-09	6.82E-05	/[	6.00E-06	x	1000	]=	1.14E-02
Copper	1.63E-06	x		=	NA	1.14E-04	/[		x	1000	]=	NA
Fluoride	1.80E-07	x		=	NA	1.26E-05	/[	1.30E-02	x	1000	]=	9.71E-07
Iron	2.84E-03	x		=	NA	1.99E-01	/[		x	1000	]=	NA
Lithium	1.02E-06	x		=	NA	7.16E-05	/[		x	1000	]=	NA
Manganese	4.52E-05	x		=	NA	3.16E-03	/[	5.00E-05	x	1000	]=	6.32E-02
Mercury	1.91E-09	x	0.00E+00	=	0.00E+00	1.34E-07	/[	3.00E-04	x	1000	]=	4.46E-07
Nickel	1.62E-06	x	2.60E-04	=	4.20E-10	1.13E-04	/[	9.00E-05	x	1000	]=	1.26E-03
Nitrate	1.09E-06	x		=	NA	7.62E-05	/[		x	1000	]=	NA
Nitrite	2.95E-07	x		=	NA	2.06E-05	/[		x	1000	]=	NA
Silver	7.36E-09	x		=	NA	5.15E-07	/[		x	1000	]=	NA
Strontium	1.47E-05	x		=	NA	1.03E-03	/[		x	1000	]=	NA
Tin	4.24E-07	x		=	NA	2.97E-05	/[		x	1000	]=	NA
Total Uranium	7.67E-08	x		=	NA	5.37E-06	/[	4.00E-05	x	1000	]=	1.34E-04
Vanadium	6.40E-06	x		=	NA	4.48E-04	/[	1.00E-04	x	1000	]=	4.48E-03
Zinc	6.17E-06	x		=	NA	4.32E-04	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.44E-07	x	2.40E-06	=	5.86E-13	1.71E-05	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	9.17E-09	x	0.00E+00	=	0.00E+00	6.42E-07	/[		x	1000	]=	NA
			Pathway total =		1.28E-07					Pathway total =		1.03E-01

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.93E-09	x	1.50E+00	=	5.90E-09	2.75E-07	/	3.00E-04	=	9.17E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.88E-12	x		=	NA	1.31E-10	/	2.50E-05	=	5.25E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	3.44E-09	x	1.40E-02	=	4.81E-11	2.41E-07	/	2.00E-02	=	1.20E-05
Butylbenzylphthalate	1.29E-10	x	1.90E-03	=	2.45E-13	9.04E-09	/	2.00E-01	=	4.52E-08
			Pathway total =		5.94E-09			Pathway total =		9.34E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-03
Arsenic	Sum of all pathways	=	7.54E-08	Sum of all pathways	=	1.5E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-03
Beryllium	Sum of all pathways	=	9.28E-11	Sum of all pathways	=	2.0E-04
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-04
Cadmium	Sum of all pathways	=	2.40E-11	Sum of all pathways	=	1.4E-04
Chromium	Sum of all pathways	=	1.15E-07	Sum of all pathways	=	2.5E-03
Cobalt	Sum of all pathways	=	8.77E-09	Sum of all pathways	=	2.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-07
Nickel	Sum of all pathways	=	4.20E-10	Sum of all pathways	=	1.5E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	9.7E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.09E-10	Sum of all pathways	=	5.2E-05
Butylbenzylphthalate	Sum of all pathways	=	1.06E-12	Sum of all pathways	=	2.0E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	2E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.53E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.54E-05	=	[	6.40E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.49E-09	=	[	2.69E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.99E-08	=	[	3.60E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	4.62E-07	=	[	8.34E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	9.07E-10	=	[	1.64E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	5.29E-10	=	[	9.56E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	5.36E-08	=	[	9.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	4.57E-08	=	[	8.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	6.74E-08	=	[	1.22E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	7.00E-09	=	[	1.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.17E-04	=	[	2.11E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	3.91E-08	=	[	7.07E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	1.97E-06	=	[	3.56E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	9.47E-11	=	[	1.71E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	1.36E-08	=	[	2.45E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	7.27E-08	=	[	1.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	4.25E-08	=	[	7.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	1.72E-08	=	[	3.10E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	7.47E-09	=	[	1.35E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	5.20E-10	=	[	9.40E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	1.72E-07	=	[	3.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.81E-09	=	[	6.88E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.27E-07	=	[	5.91E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.10E-07	=	[	3.80E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	2.56E-10	=	[	4.62E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
1-Butanol	1.23E-10	=	[	2.22E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.02E-08	=	[	1.84E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.28E-10	=	[	5.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Hexane	3.35E-10	=	[	6.05E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	1.25E-10	=	[	2.27E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.48E-03	=	[	6.40E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	1.04E-07	=	[	2.69E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.39E-06	=	[	3.60E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.23E-05	=	[	8.34E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	6.35E-08	=	[	1.64E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	3.71E-08	=	[	9.56E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	3.75E-06	=	[	9.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.20E-06	=	[	8.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	4.72E-06	=	[	1.22E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	4.90E-07	=	[	1.26E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	8.16E-03	=	[	2.11E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	2.74E-06	=	[	7.07E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.38E-04	=	[	3.56E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	6.63E-09	=	[	1.71E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	9.49E-07	=	[	2.45E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	5.09E-06	=	[	1.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	2.98E-06	=	[	7.68E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	1.20E-06	=	[	3.10E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Selenium	5.23E-07	=	[	1.35E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	3.64E-08	=	[	9.40E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.20E-05	=	[	3.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.66E-07	=	[	6.88E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.29E-05	=	[	5.91E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.47E-05	=	[	3.80E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Acetone	1.79E-08	=	[	4.62E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
1-Butanol	8.60E-09	=	[	2.22E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	7.13E-07	=	[	1.84E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	2.29E-08	=	[	5.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Hexane	2.34E-08	=	[	6.05E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	8.78E-09	=	[	2.27E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.54E-04	=	[	1.9E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	3.18E-08	=	[	8.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	4.24E-07	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	9.84E-06	=	[	2.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	1.93E-08	=	[	4.9E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.13E-08	=	[	2.9E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.14E-06	=	[	2.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	9.74E-07	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.44E-06	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	1.49E-07	=	[	3.8E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.48E-03	=	[	6.3E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	8.33E-07	=	[	2.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.20E-05	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	2.02E-09	=	[	5.2E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Molybdenum	2.89E-07	=	[	7.4E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.55E-06	=	[	4.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	9.06E-07	=	[	2.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	3.65E-07	=	[	9.3E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Selenium	1.59E-07	=	[	4.1E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	1.11E-08	=	[	2.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	3.66E-06	=	[	9.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	8.11E-08	=	[	2.1E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	6.97E-06	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	4.48E-06	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Acetone	5.42E-09	=	[	1.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
1-Butanol	2.59E-09	=	[	6.6E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.17E-07	=	[	5.5E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.98E-09	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Hexane	7.13E-09	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
beta-BHC	2.67E-09	=	[	6.8E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	5.28E-02	=	[	1.9E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.22E-06	=	[	8.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	2.97E-05	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	6.89E-04	=	[	2.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	1.35E-06	=	[	4.9E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	7.89E-07	=	[	2.9E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	7.99E-05	=	[	2.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	6.82E-05	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.00E-04	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.04E-05	=	[	3.8E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	1.74E-01	=	[	6.3E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	5.83E-05	=	[	2.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	2.94E-03	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.41E-07	=	[	5.2E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Molybdenum	2.02E-05	=	[	7.4E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	1.08E-04	=	[	4.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	6.34E-05	=	[	2.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	2.56E-05	=	[	9.3E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Selenium	1.11E-05	=	[	4.1E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	7.75E-07	=	[	2.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	2.56E-04	=	[	9.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	5.67E-06	=	[	2.1E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	4.88E-04	=	[	1.8E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.14E-04	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Acetone	3.80E-07	=	[	1.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
1-Butanol	1.81E-07	=	[	6.6E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Bis(2-ethylhexyl) phthalate	1.52E-05	=	[	5.5E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	4.89E-07	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Hexane	4.99E-07	=	[	1.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
beta-BHC	1.87E-07	=	[	6.8E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	1.79E-09	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.59E-12	=	[	9.56E-02	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
1-Butanol	3.69E-11	=	[	2.22E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.06E-09	=	[	1.84E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	9.83E-11	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	3.76E-11	=	[	2.27E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.26E-07	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.11E-10	=	[	9.56E-02	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
1-Butanol	2.58E-09	=	[	2.22E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	2.14E-07	=	[	1.84E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	6.88E-09	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	2.63E-09	=	[	2.27E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.54E-05	x	0.00E+00	=	0.00E+00	2.48E-03	/	1.00E+00	=	2.48E-03
Antimony	1.49E-09	x	0.00E+00	=	0.00E+00	1.04E-07	/	4.00E-04	=	2.61E-04
Arsenic	1.99E-08	x	1.50E+00	=	2.99E-08	1.39E-06	/	3.00E-04	=	4.65E-03
Barium	4.62E-07	x	0.00E+00	=	0.00E+00	3.23E-05	/	2.00E-01	=	1.62E-04
Beryllium	9.07E-10	x	0.00E+00	=	0.00E+00	6.35E-08	/	2.00E-03	=	3.17E-05
Cadmium	5.29E-10	x	0.00E+00	=	0.00E+00	3.71E-08	/	1.00E-03	=	3.71E-05
Chromium	5.36E-08	x	0.00E+00	=	0.00E+00	3.75E-06	/	3.00E-03	=	1.25E-03
Cobalt	4.57E-08	x	0.00E+00	=	0.00E+00	3.20E-06	/	3.00E-04	=	1.07E-02
Copper	6.74E-08	x	0.00E+00	=	0.00E+00	4.72E-06	/	4.00E-02	=	1.18E-04
Fluoride	7.00E-09	x	0.00E+00	=	0.00E+00	4.90E-07	/	4.00E-02	=	1.22E-05
Iron	1.17E-04	x	0.00E+00	=	0.00E+00	8.16E-03	/	7.00E-01	=	1.17E-02
Lithium	3.91E-08	x	0.00E+00	=	0.00E+00	2.74E-06	/	2.00E-03	=	1.37E-03
Manganese	1.97E-06	x	0.00E+00	=	0.00E+00	1.38E-04	/	1.40E-01	=	9.85E-04
Mercury	9.47E-11	x	0.00E+00	=	0.00E+00	6.63E-09	/	0.00E+00	=	NA
Molybdenum	1.36E-08	x	0.00E+00	=	0.00E+00	9.49E-07	/	5.00E-03	=	1.90E-04
Nickel	7.27E-08	x	0.00E+00	=	0.00E+00	5.09E-06	/	2.00E-02	=	2.54E-04
Nitrate	4.25E-08	x	0.00E+00	=	0.00E+00	2.98E-06	/	1.60E+00	=	1.86E-06
Nitrite	1.72E-08	x	0.00E+00	=	0.00E+00	1.20E-06	/	1.00E-01	=	1.20E-05
Selenium	7.47E-09	x	0.00E+00	=	0.00E+00	5.23E-07	/	5.00E-03	=	1.05E-04
Silver	5.20E-10	x	0.00E+00	=	0.00E+00	3.64E-08	/	5.00E-03	=	7.28E-06
Strontium	1.72E-07	x	0.00E+00	=	0.00E+00	1.20E-05	/	6.00E-01	=	2.00E-05
Total Uranium	3.81E-09	x	0.00E+00	=	0.00E+00	2.66E-07	/	3.00E-03	=	8.88E-05
Vanadium	3.27E-07	x	0.00E+00	=	0.00E+00	2.29E-05	/	5.00E-03	=	4.58E-03
Zinc	2.10E-07	x	0.00E+00	=	0.00E+00	1.47E-05	/	3.00E-01	=	4.91E-05
Acetone	2.56E-10	x	0.00E+00	=	0.00E+00	1.79E-08	/	9.00E-01	=	1.99E-08
1-Butanol	1.23E-10	x	0.00E+00	=	0.00E+00	8.60E-09	/	1.00E-01	=	8.60E-08
Bis(2-ethylhexyl) phthalate	1.02E-08	x	1.40E-02	=	1.43E-10	7.13E-07	/	2.00E-02	=	3.56E-05
Butylbenzylphthalate	3.28E-10	x	1.90E-03	=	6.23E-13	2.29E-08	/	2.00E-01	=	1.15E-07
Hexane	3.35E-10	x	0.00E+00	=	0.00E+00	2.34E-08	/	6.00E-02	=	3.91E-07
beta-BHC	1.25E-10	x	1.80E+00	=	2.26E-10	8.78E-09	/	0.00E+00	=	NA
			Pathway total	=	3.03E-08			Pathway total	=	3.90E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.54E-04	x		=	NA	5.28E-02	/[	5.00E-03	x	1000	]=	1.06E-02
Antimony	3.18E-08	x		=	NA	2.22E-06	/[		x	1000	]=	NA
Arsenic	4.24E-07	x	4.30E-03	=	1.82E-09	2.97E-05	/[	1.50E-05	x	1000	]=	1.98E-03
Barium	9.84E-06	x		=	NA	6.89E-04	/[	5.00E-04	x	1000	]=	1.38E-03
Beryllium	1.93E-08	x	2.40E-03	=	4.64E-11	1.35E-06	/[	2.00E-05	x	1000	]=	6.76E-05
Cadmium	1.13E-08	x	1.80E-03	=	2.03E-11	7.89E-07	/[	1.00E-05	x	1000	]=	7.89E-05
Chromium	1.14E-06	x	8.40E-02	=	9.58E-08	7.99E-05	/[	1.00E-04	x	1000	]=	7.99E-04
Cobalt	9.74E-07	x	9.00E-03	=	8.76E-09	6.82E-05	/[	6.00E-06	x	1000	]=	1.14E-02
Copper	1.44E-06	x		=	NA	1.00E-04	/[		x	1000	]=	NA
Fluoride	1.49E-07	x		=	NA	1.04E-05	/[	1.30E-02	x	1000	]=	8.02E-07
Iron	2.48E-03	x		=	NA	1.74E-01	/[		x	1000	]=	NA
Lithium	8.33E-07	x		=	NA	5.83E-05	/[		x	1000	]=	NA
Manganese	4.20E-05	x		=	NA	2.94E-03	/[	5.00E-05	x	1000	]=	5.87E-02
Mercury	2.02E-09	x	0.00E+00	=	0.00E+00	1.41E-07	/[	3.00E-04	x	1000	]=	4.70E-07
Molybdenum	2.89E-07	x	0.00E+00	=	0.00E+00	2.02E-05	/[	0.00E+00	x	1000	]=	NA
Nickel	1.55E-06	x	2.60E-04	=	4.03E-10	1.08E-04	/[	9.00E-05	x	1000	]=	1.20E-03
Nitrate	9.06E-07	x		=	NA	6.34E-05	/[		x	1000	]=	NA
Nitrite	3.65E-07	x		=	NA	2.56E-05	/[		x	1000	]=	NA
Selenium	1.59E-07	x	0.00E+00	=	0.00E+00	1.11E-05	/[	2.00E-02	x	1000	]=	5.57E-07
Silver	1.11E-08	x		=	NA	7.75E-07	/[		x	1000	]=	NA
Strontium	3.66E-06	x		=	NA	2.56E-04	/[		x	1000	]=	NA
Total Uranium	8.11E-08	x		=	NA	5.67E-06	/[	4.00E-05	x	1000	]=	1.42E-04
Vanadium	6.97E-06	x		=	NA	4.88E-04	/[	1.00E-04	x	1000	]=	4.88E-03
Zinc	4.48E-06	x		=	NA	3.14E-04	/[		x	1000	]=	NA
Acetone	5.42E-09	x	0.00E+00	=	0.00E+00	3.80E-07	/[	3.10E+01	x	1000	]=	1.22E-11
1-Butanol	2.59E-09	x	0.00E+00	=	0.00E+00	1.81E-07	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.17E-07	x	2.40E-06	=	5.21E-13	1.52E-05	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.98E-09	x	0.00E+00	=	0.00E+00	4.89E-07	/[		x	1000	]=	NA
Hexane	7.13E-09	x	0.00E+00	=	0.00E+00	4.99E-07	/[	7.00E-01	x	1000	]=	7.13E-10
beta-BHC	2.67E-09	x	5.30E-04	=	1.42E-12	1.87E-07	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.07E-07					Pathway total =		9.12E-02

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.79E-09	x	1.50E+00	=	2.69E-09	1.26E-07	/	3.00E-04	=	4.18E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.59E-12	x		=	NA	1.11E-10	/	2.50E-05	=	4.45E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	3.69E-11	x		=	NA	2.58E-09	/	1.00E-01	=	2.58E-08
Bis(2-ethylhexyl) phthalate	3.06E-09	x	1.40E-02	=	4.28E-11	2.14E-07	/	2.00E-02	=	1.07E-05
Butylbenzylphthalate	9.83E-11	x	1.90E-03	=	1.87E-13	6.88E-09	/	2.00E-01	=	3.44E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	3.76E-11	x	1.80E+00	=	6.77E-11	2.63E-09	/		=	NA
			Pathway total =		2.80E-09			Pathway total =		4.34E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Arsenic	Sum of all pathways	=	3.44E-08	Sum of all pathways	=	7.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Beryllium	Sum of all pathways	=	4.64E-11	Sum of all pathways	=	9.9E-05
Cadmium	Sum of all pathways	=	2.03E-11	Sum of all pathways	=	1.2E-04
Chromium	Sum of all pathways	=	9.58E-08	Sum of all pathways	=	2.0E-03
Cobalt	Sum of all pathways	=	8.76E-09	Sum of all pathways	=	2.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-07
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Nickel	Sum of all pathways	=	4.03E-10	Sum of all pathways	=	1.5E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-08
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.86E-10	Sum of all pathways	=	4.6E-05
Butylbenzylphthalate	Sum of all pathways	=	8.09E-13	Sum of all pathways	=	1.5E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-07
beta-BHC	Sum of all pathways	=	2.95E-10	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1E-07	All Pathways and Chemicals	=	1.31E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.95E-05	=	[	7.13E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.30E-09	=	[	2.35E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.80E-08	=	[	5.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	4.51E-07	=	[	8.15E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	1.53E-09	=	[	2.76E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	6.69E-10	=	[	1.21E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	6.87E-08	=	[	1.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	5.07E-08	=	[	9.16E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	7.07E-08	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.59E-08	=	[	2.87E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.40E-04	=	[	2.53E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	4.63E-08	=	[	8.37E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.02E-06	=	[	3.64E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	1.06E-10	=	[	1.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	6.15E-08	=	[	1.11E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	6.33E-08	=	[	1.14E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	2.55E-08	=	[	4.61E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	9.82E-10	=	[	1.77E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	1.83E-07	=	[	3.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Tin	7.97E-08	=	[	1.44E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	8.68E-09	=	[	1.57E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	4.30E-07	=	[	7.78E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	1.02E-06	=	[	1.83E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	5.43E-11	=	[	9.80E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.27E-08	=	[	2.30E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Di-n-butylphthalate	4.78E-09	=	[	8.63E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	7.42E-12	=	[	1.34E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	1.63E-12	=	[	2.94E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	1.43E-10	=	[	2.58E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1260	1.48E-10	=	[	2.68E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.76E-03	=	[	7.13E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	9.11E-08	=	[	2.35E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.96E-06	=	[	5.06E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.16E-05	=	[	8.15E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	1.07E-07	=	[	2.76E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	4.68E-08	=	[	1.21E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	4.81E-06	=	[	1.24E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.55E-06	=	[	9.16E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	4.95E-06	=	[	1.28E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	1.11E-06	=	[	2.87E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	9.81E-03	=	[	2.53E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.24E-06	=	[	8.37E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.41E-04	=	[	3.64E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	7.44E-09	=	[	1.92E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	4.30E-06	=	[	1.11E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	4.43E-06	=	[	1.14E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	1.79E-06	=	[	4.61E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	6.87E-08	=	[	1.77E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.28E-05	=	[	3.31E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Tin	5.58E-06	=	[	1.44E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	6.08E-07	=	[	1.57E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	3.01E-05	=	[	7.78E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	7.11E-05	=	[	1.83E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Acetone	3.80E-09	=	[	9.80E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	8.91E-07	=	[	2.30E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Di-n-butylphthalate	3.34E-07	=	[	8.63E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	5.19E-10	=	[	1.34E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	1.14E-10	=	[	2.94E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	1.00E-08	=	[	2.58E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1260	1.04E-08	=	[	2.68E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.40E-04	=	[	2.1E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	2.77E-08	=	[	7.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	5.97E-07	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	9.61E-06	=	[	2.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	3.26E-08	=	[	8.3E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	1.42E-08	=	[	3.6E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.46E-06	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.08E-06	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.51E-06	=	[	3.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	3.39E-07	=	[	8.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.98E-03	=	[	7.6E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	9.86E-07	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.29E-05	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	2.26E-09	=	[	5.8E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.31E-06	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	1.35E-06	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	5.43E-07	=	[	1.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	2.09E-08	=	[	5.3E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	3.91E-06	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Tin	1.70E-06	=	[	4.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	1.85E-07	=	[	4.7E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	9.17E-06	=	[	2.3E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	2.16E-05	=	[	5.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Acetone	1.15E-09	=	[	2.9E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.71E-07	=	[	6.9E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	1.02E-07	=	[	2.6E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Methylene chloride	1.58E-10	=	[	4.0E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	3.46E-11	=	[	8.8E-08	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
beta-BHC	3.04E-09	=	[	7.8E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.16E-09	=	[	8.1E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	5.88E-02	=	[	2.1E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	1.94E-06	=	[	7.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	4.18E-05	=	[	1.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	6.73E-04	=	[	2.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	2.28E-06	=	[	8.3E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	9.97E-07	=	[	3.6E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	1.02E-04	=	[	3.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	7.56E-05	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.05E-04	=	[	3.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	2.37E-05	=	[	8.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	2.09E-01	=	[	7.6E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	6.90E-05	=	[	2.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.01E-03	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.58E-07	=	[	5.8E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	9.17E-05	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	9.44E-05	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	3.80E-05	=	[	1.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	1.46E-06	=	[	5.3E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	2.73E-04	=	[	1.0E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Tin	1.19E-04	=	[	4.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	1.29E-05	=	[	4.7E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	6.42E-04	=	[	2.3E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	1.51E-03	=	[	5.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Acetone	8.06E-08	=	[	2.9E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Bis(2-ethylhexyl) phthalate	1.90E-05	=	[	6.9E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Di-n-butylphthalate	7.12E-06	=	[	2.6E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Methylene chloride	1.11E-08	=	[	4.0E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	2.42E-09	=	[	8.8E-08	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
beta-BHC	2.13E-07	=	[	7.8E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Aroclor-1260	2.21E-07	=	[	8.1E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.52E-09	=	[	5.06E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	2.01E-12	=	[	1.21E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.82E-09	=	[	2.30E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.43E-09	=	[	8.63E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
beta-BHC	4.28E-11	=	[	2.58E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Aroclor-1260	6.23E-11	=	[	2.68E-02	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	1.77E-07	=	[	5.06E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.40E-10	=	[	1.21E-01	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Bis(2-ethylhexyl) phthalate	2.67E-07	=	[	2.30E+00	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Di-n-butylphthalate	1.00E-07	=	[	8.63E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
beta-BHC	3.00E-09	=	[	2.58E-02	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
Aroclor-1260	4.36E-09	=	[	2.68E-02	x	1.00E-06	x	3,300	x	0.3	x	0.14	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.95E-05	x	0.00E+00	=	0.00E+00	2.76E-03	/	1.00E+00	=	2.76E-03
Antimony	1.30E-09	x	0.00E+00	=	0.00E+00	9.11E-08	/	4.00E-04	=	2.28E-04
Arsenic	2.80E-08	x	1.50E+00	=	4.20E-08	1.96E-06	/	3.00E-04	=	6.54E-03
Barium	4.51E-07	x	0.00E+00	=	0.00E+00	3.16E-05	/	2.00E-01	=	1.58E-04
Beryllium	1.53E-09	x	0.00E+00	=	0.00E+00	1.07E-07	/	2.00E-03	=	5.35E-05
Cadmium	6.69E-10	x	0.00E+00	=	0.00E+00	4.68E-08	/	1.00E-03	=	4.68E-05
Chromium	6.87E-08	x	0.00E+00	=	0.00E+00	4.81E-06	/	3.00E-03	=	1.60E-03
Cobalt	5.07E-08	x	0.00E+00	=	0.00E+00	3.55E-06	/	3.00E-04	=	1.18E-02
Copper	7.07E-08	x	0.00E+00	=	0.00E+00	4.95E-06	/	4.00E-02	=	1.24E-04
Fluoride	1.59E-08	x	0.00E+00	=	0.00E+00	1.11E-06	/	4.00E-02	=	2.78E-05
Iron	1.40E-04	x	0.00E+00	=	0.00E+00	9.81E-03	/	7.00E-01	=	1.40E-02
Lithium	4.63E-08	x	0.00E+00	=	0.00E+00	3.24E-06	/	2.00E-03	=	1.62E-03
Manganese	2.02E-06	x	0.00E+00	=	0.00E+00	1.41E-04	/	1.40E-01	=	1.01E-03
Mercury	1.06E-10	x	0.00E+00	=	0.00E+00	7.44E-09	/	0.00E+00	=	NA
Nickel	6.15E-08	x	0.00E+00	=	0.00E+00	4.30E-06	/	2.00E-02	=	2.15E-04
Nitrate	6.33E-08	x	0.00E+00	=	0.00E+00	4.43E-06	/	1.60E+00	=	2.77E-06
Nitrite	2.55E-08	x	0.00E+00	=	0.00E+00	1.79E-06	/	1.00E-01	=	1.79E-05
Silver	9.82E-10	x	0.00E+00	=	0.00E+00	6.87E-08	/	5.00E-03	=	1.37E-05
Strontium	1.83E-07	x	0.00E+00	=	0.00E+00	1.28E-05	/	6.00E-01	=	2.14E-05
Tin	7.97E-08	x	0.00E+00	=	0.00E+00	5.58E-06	/	6.00E-01	=	9.30E-06
Total Uranium	8.68E-09	x	0.00E+00	=	0.00E+00	6.08E-07	/	3.00E-03	=	2.03E-04
Vanadium	4.30E-07	x	0.00E+00	=	0.00E+00	3.01E-05	/	5.00E-03	=	6.03E-03
Zinc	1.02E-06	x	0.00E+00	=	0.00E+00	7.11E-05	/	3.00E-01	=	2.37E-04
Acetone	5.43E-11	x	0.00E+00	=	0.00E+00	3.80E-09	/	9.00E-01	=	4.22E-09
Bis(2-ethylhexyl) phthalate	1.27E-08	x	1.40E-02	=	1.78E-10	8.91E-07	/	2.00E-02	=	4.46E-05
Di-n-butylphthalate	4.78E-09	x	0.00E+00	=	0.00E+00	3.34E-07	/	1.00E-01	=	3.34E-06
Methylene chloride	7.42E-12	x	2.00E-03	=	1.48E-14	5.19E-10	/	6.00E-03	=	8.66E-08
Toluene	1.63E-12	x	0.00E+00	=	0.00E+00	1.14E-10	/	8.00E-02	=	1.42E-09
beta-BHC	1.43E-10	x	1.80E+00	=	2.57E-10	1.00E-08	/	0.00E+00	=	NA
Aroclor-1260	1.48E-10	x	2.00E+00	=	2.97E-10	1.04E-08	/	0.00E+00	=	NA
			Pathway total	=	4.28E-08			Pathway total	=	4.68E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.40E-04	x		=	NA	5.88E-02	/[	5.00E-03	x	1000	]=	1.18E-02
Antimony	2.77E-08	x		=	NA	1.94E-06	/[		x	1000	]=	NA
Arsenic	5.97E-07	x	4.30E-03	=	2.57E-09	4.18E-05	/[	1.50E-05	x	1000	]=	2.79E-03
Barium	9.61E-06	x		=	NA	6.73E-04	/[	5.00E-04	x	1000	]=	1.35E-03
Beryllium	3.26E-08	x	2.40E-03	=	7.81E-11	2.28E-06	/[	2.00E-05	x	1000	]=	1.14E-04
Cadmium	1.42E-08	x	1.80E-03	=	2.56E-11	9.97E-07	/[	1.00E-05	x	1000	]=	9.97E-05
Chromium	1.46E-06	x	8.40E-02	=	1.23E-07	1.02E-04	/[	1.00E-04	x	1000	]=	1.02E-03
Cobalt	1.08E-06	x	9.00E-03	=	9.72E-09	7.56E-05	/[	6.00E-06	x	1000	]=	1.26E-02
Copper	1.51E-06	x		=	NA	1.05E-04	/[		x	1000	]=	NA
Fluoride	3.39E-07	x		=	NA	2.37E-05	/[	1.30E-02	x	1000	]=	1.82E-06
Iron	2.98E-03	x		=	NA	2.09E-01	/[		x	1000	]=	NA
Lithium	9.86E-07	x		=	NA	6.90E-05	/[		x	1000	]=	NA
Manganese	4.29E-05	x		=	NA	3.01E-03	/[	5.00E-05	x	1000	]=	6.01E-02
Mercury	2.26E-09	x	0.00E+00	=	0.00E+00	1.58E-07	/[	3.00E-04	x	1000	]=	5.28E-07
Nickel	1.31E-06	x	2.60E-04	=	3.40E-10	9.17E-05	/[	9.00E-05	x	1000	]=	1.02E-03
Nitrate	1.35E-06	x		=	NA	9.44E-05	/[		x	1000	]=	NA
Nitrite	5.43E-07	x		=	NA	3.80E-05	/[		x	1000	]=	NA
Silver	2.09E-08	x		=	NA	1.46E-06	/[		x	1000	]=	NA
Strontium	3.91E-06	x		=	NA	2.73E-04	/[		x	1000	]=	NA
Tin	1.70E-06	x		=	NA	1.19E-04	/[		x	1000	]=	NA
Total Uranium	1.85E-07	x		=	NA	1.29E-05	/[	4.00E-05	x	1000	]=	3.24E-04
Vanadium	9.17E-06	x		=	NA	6.42E-04	/[	1.00E-04	x	1000	]=	6.42E-03
Zinc	2.16E-05	x		=	NA	1.51E-03	/[		x	1000	]=	NA
Acetone	1.15E-09	x	0.00E+00	=	0.00E+00	8.06E-08	/[	3.10E+01	x	1000	]=	2.60E-12
Bis(2-ethylhexyl) phthalate	2.71E-07	x	2.40E-06	=	6.51E-13	1.90E-05	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	1.02E-07	x	0.00E+00	=	0.00E+00	7.12E-06	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.58E-10	x	1.00E-08	=	1.58E-18	1.11E-08	/[	6.00E-01	x	1000	]=	1.84E-11
Toluene	3.46E-11	x	0.00E+00	=	0.00E+00	2.42E-09	/[	5.00E+00	x	1000	]=	4.85E-13
beta-BHC	3.04E-09	x	5.30E-04	=	1.61E-12	2.13E-07	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.16E-09	x	5.70E-04	=	1.80E-12	2.21E-07	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.36E-07					Pathway total =		9.76E-02

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.52E-09	x	1.50E+00	=	3.78E-09	1.77E-07	/	3.00E-04	=	5.89E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.01E-12	x		=	NA	1.40E-10	/	2.50E-05	=	5.62E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	3.82E-09	x	1.40E-02	=	5.35E-11	2.67E-07	/	2.00E-02	=	1.34E-05
Di-n-butylphthalate	1.43E-09	x		=	NA	1.00E-07	/	1.00E-01	=	1.00E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	4.28E-11	x	1.80E+00	=	7.71E-11	3.00E-09	/		=	NA
Aroclor-1260	6.23E-11	x	2.00E+00	=	1.25E-10	4.36E-09	/		=	NA
			Pathway total =		**4.04E-09**			Pathway total =		6.09E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Arsenic	Sum of all pathways	=	4.84E-08	Sum of all pathways	=	9.9E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Beryllium	Sum of all pathways	=	7.81E-11	Sum of all pathways	=	1.7E-04
Cadmium	Sum of all pathways	=	2.56E-11	Sum of all pathways	=	1.5E-04
Chromium	Sum of all pathways	=	1.23E-07	Sum of all pathways	=	2.6E-03
Cobalt	Sum of all pathways	=	9.72E-09	Sum of all pathways	=	2.4E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-07
Nickel	Sum of all pathways	=	3.40E-10	Sum of all pathways	=	1.2E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.32E-10	Sum of all pathways	=	5.8E-05
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-06
Methylene chloride	Sum of all pathways	=	1.48E-14	Sum of all pathways	=	8.7E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-09
beta-BHC	Sum of all pathways	=	3.36E-10	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	4.23E-10	Sum of all pathways	=	NA

Total Carcinogenic Risk All Pathways and Chemicals	=	2E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.45E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.64E-05	=	[	8.39E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.36E-09	=	[	2.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	3.23E-08	=	[	5.83E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	4.38E-07	=	[	7.92E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	9.69E-10	=	[	1.75E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	1.92E-08	=	[	3.47E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	6.20E-08	=	[	1.12E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	5.81E-08	=	[	1.05E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	8.19E-08	=	[	1.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.95E-08	=	[	3.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.43E-04	=	[	2.59E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	5.01E-08	=	[	9.05E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.26E-06	=	[	4.09E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	7.47E-11	=	[	1.35E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	6.09E-08	=	[	1.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	2.20E-07	=	[	3.97E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	2.94E-08	=	[	5.31E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	3.88E-09	=	[	7.01E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Silver	3.84E-10	=	[	6.94E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	2.06E-07	=	[	3.73E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.65E-09	=	[	6.60E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	3.55E-07	=	[	6.42E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.69E-07	=	[	4.86E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	3.54E-11	=	[	6.40E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.92E-10	=	[	1.07E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
2-Hexanone	1.53E-11	=	[	2.77E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	7.75E-12	=	[	1.40E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	3.28E-12	=	[	5.92E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	3.25E-03	=	[	8.39E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	9.49E-08	=	[	2.45E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.26E-06	=	[	5.83E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.07E-05	=	[	7.92E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	6.78E-08	=	[	1.75E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cadmium	1.34E-06	=	[	3.47E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	4.34E-06	=	[	1.12E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	4.07E-06	=	[	1.05E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	5.73E-06	=	[	1.48E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	1.37E-06	=	[	3.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	1.00E-02	=	[	2.59E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.51E-06	=	[	9.05E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.58E-04	=	[	4.09E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	5.23E-09	=	[	1.35E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	4.26E-06	=	[	1.10E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	1.54E-05	=	[	3.97E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	2.06E-06	=	[	5.31E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Selenium	2.72E-07	=	[	7.01E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Silver	2.69E-08	=	[	6.94E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.45E-05	=	[	3.73E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.56E-07	=	[	6.60E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.49E-05	=	[	6.42E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.88E-05	=	[	4.86E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Acetone	2.48E-09	=	[	6.40E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	4.15E-08	=	[	1.07E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
2-Hexanone	1.07E-09	=	[	2.77E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	5.42E-10	=	[	1.40E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	2.29E-10	=	[	5.92E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.89E-04	=	[	2.5E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	2.89E-08	=	[	7.4E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	6.87E-07	=	[	1.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	9.34E-06	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	2.06E-08	=	[	5.3E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cadmium	4.09E-07	=	[	1.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.32E-06	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.24E-06	=	[	3.2E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.74E-06	=	[	4.5E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	4.16E-07	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	3.05E-03	=	[	7.8E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	1.07E-06	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.82E-05	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	1.59E-09	=	[	4.1E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.30E-06	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	4.68E-06	=	[	1.2E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	6.26E-07	=	[	1.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Selenium	8.26E-08	=	[	2.1E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Silver	8.18E-09	=	[	2.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	4.40E-06	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	7.78E-08	=	[	2.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	7.57E-06	=	[	1.9E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	5.73E-06	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Acetone	7.51E-10	=	[	1.9E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.26E-08	=	[	3.2E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
2-Hexanone	3.25E-10	=	[	8.3E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Methylene chloride	1.65E-10	=	[	4.2E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	6.97E-11	=	[	1.8E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	6.92E-02	=	[	2.5E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.02E-06	=	[	7.4E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	4.81E-05	=	[	1.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	6.54E-04	=	[	2.4E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	1.44E-06	=	[	5.3E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cadmium	2.86E-05	=	[	1.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	9.24E-05	=	[	3.4E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	8.66E-05	=	[	3.2E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.22E-04	=	[	4.5E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	2.91E-05	=	[	1.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	2.14E-01	=	[	7.8E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	7.47E-05	=	[	2.7E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.38E-03	=	[	1.2E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.11E-07	=	[	4.1E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	9.08E-05	=	[	3.3E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	3.28E-04	=	[	1.2E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	4.38E-05	=	[	1.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Selenium	5.78E-06	=	[	2.1E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Silver	5.73E-07	=	[	2.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	3.08E-04	=	[	1.1E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	5.45E-06	=	[	2.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	5.30E-04	=	[	1.9E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	4.01E-04	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Acetone	5.26E-08	=	[	1.9E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Butylbenzylphthalate	8.83E-07	=	[	3.2E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
2-Hexanone	2.28E-08	=	[	8.3E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Methylene chloride	1.15E-08	=	[	4.2E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	4.88E-09	=	[	1.8E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	2.90E-09	=	[	5.83E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cadmium	5.76E-11	=	[	3.47E+00	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.78E-10	=	[	1.07E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.03E-07	=	[	5.83E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Cadmium	4.03E-09	=	[	3.47E+00	x	1.00E-06	x	3,300	x	0.3	x	0.001	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Butylbenzylphthalate	1.24E-08	=	[	1.07E-01	x	1.00E-06	x	3,300	x	0.3	x	0.1	x	1	x	30	x	1	]	/	[	70	x	365	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.64E-05	x	0.00E+00	=	0.00E+00	3.25E-03	/	1.00E+00	=	3.25E-03
Antimony	1.36E-09	x	0.00E+00	=	0.00E+00	9.49E-08	/	4.00E-04	=	2.37E-04
Arsenic	3.23E-08	x	1.50E+00	=	4.84E-08	2.26E-06	/	3.00E-04	=	7.53E-03
Barium	4.38E-07	x	0.00E+00	=	0.00E+00	3.07E-05	/	2.00E-01	=	1.53E-04
Beryllium	9.69E-10	x	0.00E+00	=	0.00E+00	6.78E-08	/	2.00E-03	=	3.39E-05
Cadmium	1.92E-08	x	0.00E+00	=	0.00E+00	1.34E-06	/	1.00E-03	=	1.34E-03
Chromium	6.20E-08	x	0.00E+00	=	0.00E+00	4.34E-06	/	3.00E-03	=	1.45E-03
Cobalt	5.81E-08	x	0.00E+00	=	0.00E+00	4.07E-06	/	3.00E-04	=	1.36E-02
Copper	8.19E-08	x	0.00E+00	=	0.00E+00	5.73E-06	/	4.00E-02	=	1.43E-04
Fluoride	1.95E-08	x	0.00E+00	=	0.00E+00	1.37E-06	/	4.00E-02	=	3.42E-05
Iron	1.43E-04	x	0.00E+00	=	0.00E+00	1.00E-02	/	7.00E-01	=	1.43E-02
Lithium	5.01E-08	x	0.00E+00	=	0.00E+00	3.51E-06	/	2.00E-03	=	1.75E-03
Manganese	2.26E-06	x	0.00E+00	=	0.00E+00	1.58E-04	/	1.40E-01	=	1.13E-03
Mercury	7.47E-11	x	0.00E+00	=	0.00E+00	5.23E-09	/	0.00E+00	=	NA
Nickel	6.09E-08	x	0.00E+00	=	0.00E+00	4.26E-06	/	2.00E-02	=	2.13E-04
Nitrate	2.20E-07	x	0.00E+00	=	0.00E+00	1.54E-05	/	1.60E+00	=	9.61E-06
Nitrite	2.94E-08	x	0.00E+00	=	0.00E+00	2.06E-06	/	1.00E-01	=	2.06E-05
Selenium	3.88E-09	x	0.00E+00	=	0.00E+00	2.72E-07	/	5.00E-03	=	5.43E-05
Silver	3.84E-10	x	0.00E+00	=	0.00E+00	2.69E-08	/	5.00E-03	=	5.38E-06
Strontium	2.06E-07	x	0.00E+00	=	0.00E+00	1.45E-05	/	6.00E-01	=	2.41E-05
Total Uranium	3.65E-09	x	0.00E+00	=	0.00E+00	2.56E-07	/	3.00E-03	=	8.52E-05
Vanadium	3.55E-07	x	0.00E+00	=	0.00E+00	2.49E-05	/	5.00E-03	=	4.98E-03
Zinc	2.69E-07	x	0.00E+00	=	0.00E+00	1.88E-05	/	3.00E-01	=	6.28E-05
Acetone	3.54E-11	x	0.00E+00	=	0.00E+00	2.48E-09	/	9.00E-01	=	2.76E-09
Butylbenzylphthalate	5.92E-10	x	1.90E-03	=	1.13E-12	4.15E-08	/	2.00E-01	=	2.07E-07
2-Hexanone	1.53E-11	x	0.00E+00	=	0.00E+00	1.07E-09	/	5.00E-03	=	2.15E-07
Methylene chloride	7.75E-12	x	2.00E-03	=	1.55E-14	5.42E-10	/	6.00E-03	=	9.04E-08
Toluene	3.28E-12	x	0.00E+00	=	0.00E+00	2.29E-10	/	8.00E-02	=	2.87E-09
			Pathway total	=	4.84E-08			Pathway total	=	5.04E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.89E-04	x		=	NA	6.92E-02	/[	5.00E-03	x	1000	]=	1.38E-02
Antimony	2.89E-08	x		=	NA	2.02E-06	/[		x	1000	]=	NA
Arsenic	6.87E-07	x	4.30E-03	=	2.96E-09	4.81E-05	/[	1.50E-05	x	1000	]=	3.21E-03
Barium	9.34E-06	x		=	NA	6.54E-04	/[	5.00E-04	x	1000	]=	1.31E-03
Beryllium	2.06E-08	x	2.40E-03	=	4.95E-11	1.44E-06	/[	2.00E-05	x	1000	]=	7.22E-05
Cadmium	4.09E-07	x	1.80E-03	=	7.36E-10	2.86E-05	/[	1.00E-05	x	1000	]=	2.86E-03
Chromium	1.32E-06	x	8.40E-02	=	1.11E-07	9.24E-05	/[	1.00E-04	x	1000	]=	9.24E-04
Cobalt	1.24E-06	x	9.00E-03	=	1.11E-08	8.66E-05	/[	6.00E-06	x	1000	]=	1.44E-02
Copper	1.74E-06	x		=	NA	1.22E-04	/[		x	1000	]=	NA
Fluoride	4.16E-07	x		=	NA	2.91E-05	/[	1.30E-02	x	1000	]=	2.24E-06
Iron	3.05E-03	x		=	NA	2.14E-01	/[		x	1000	]=	NA
Lithium	1.07E-06	x		=	NA	7.47E-05	/[		x	1000	]=	NA
Manganese	4.82E-05	x		=	NA	3.38E-03	/[	5.00E-05	x	1000	]=	6.75E-02
Mercury	1.59E-09	x	0.00E+00	=	0.00E+00	1.11E-07	/[	3.00E-04	x	1000	]=	3.71E-07
Nickel	1.30E-06	x	2.60E-04	=	3.37E-10	9.08E-05	/[	9.00E-05	x	1000	]=	1.01E-03
Nitrate	4.68E-06	x		=	NA	3.28E-04	/[		x	1000	]=	NA
Nitrite	6.26E-07	x		=	NA	4.38E-05	/[		x	1000	]=	NA
Selenium	8.26E-08	x	0.00E+00	=	0.00E+00	5.78E-06	/[	2.00E-02	x	1000	]=	2.89E-07
Silver	8.18E-09	x		=	NA	5.73E-07	/[		x	1000	]=	NA
Strontium	4.40E-06	x		=	NA	3.08E-04	/[		x	1000	]=	NA
Total Uranium	7.78E-08	x		=	NA	5.45E-06	/[	4.00E-05	x	1000	]=	1.36E-04
Vanadium	7.57E-06	x		=	NA	5.30E-04	/[	1.00E-04	x	1000	]=	5.30E-03
Zinc	5.73E-06	x		=	NA	4.01E-04	/[		x	1000	]=	NA
Acetone	7.51E-10	x	0.00E+00	=	0.00E+00	5.26E-08	/[	3.10E+01	x	1000	]=	1.70E-12
Butylbenzylphthalate	1.26E-08	x	0.00E+00	=	0.00E+00	8.83E-07	/[		x	1000	]=	NA
2-Hexanone	3.25E-10	x	0.00E+00	=	0.00E+00	2.28E-08	/[	3.00E-02	x	1000	]=	7.59E-10
Methylene chloride	1.65E-10	x	1.00E-08	=	1.65E-18	1.15E-08	/[	6.00E-01	x	1000	]=	1.92E-11
Toluene	6.97E-11	x	0.00E+00	=	0.00E+00	4.88E-09	/	5.00E+00	x	1000	]=	9.76E-13
			Pathway total =		1.26E-07					Pathway total =		1.11E-01

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.90E-09	x	1.50E+00	=	4.36E-09	2.03E-07	/	3.00E-04	=	6.78E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	5.76E-11	x		=	NA	4.03E-09	/	2.50E-05	=	1.61E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.78E-10	x	1.90E-03	=	3.38E-13	1.24E-08	/	2.00E-01	=	6.22E-08
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		4.36E-09			Pathway total =		8.39E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Arsenic	Sum of all pathways	=	5.57E-08	Sum of all pathways	=	1.1E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Beryllium	Sum of all pathways	=	4.95E-11	Sum of all pathways	=	1.1E-04
Cadmium	Sum of all pathways	=	7.36E-10	Sum of all pathways	=	4.4E-03
Chromium	Sum of all pathways	=	1.11E-07	Sum of all pathways	=	2.4E-03
Cobalt	Sum of all pathways	=	1.11E-08	Sum of all pathways	=	2.8E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-07
Nickel	Sum of all pathways	=	3.37E-10	Sum of all pathways	=	1.2E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	9.6E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-09
Butylbenzylphthalate	Sum of all pathways	=	1.46E-12	Sum of all pathways	=	2.7E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-07
Methylene chloride	Sum of all pathways	=	1.55E-14	Sum of all pathways	=	9.0E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	1.79E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.62E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Construction Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.58E-05	=	[	8.27E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	1.61E-09	=	[	2.91E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	3.87E-08	=	[	7.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Barium	5.36E-07	=	[	9.69E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	1.30E-09	=	[	2.35E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Boron	3.55E-08	=	[	6.42E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	5.54E-08	=	[	1.00E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	4.83E-08	=	[	8.73E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Copper	7.31E-08	=	[	1.32E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	1.12E-08	=	[	2.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Iron	1.28E-04	=	[	2.31E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	5.11E-08	=	[	9.24E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	2.01E-06	=	[	3.64E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	1.14E-10	=	[	2.06E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	1.40E-08	=	[	2.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	5.42E-08	=	[	9.80E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	4.71E-08	=	[	8.51E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	1.21E-08	=	[	2.19E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	1.11E-08	=	[	2.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	2.75E-07	=	[	4.96E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	3.42E-09	=	[	6.18E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	2.87E-07	=	[	5.19E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	2.51E-07	=	[	4.53E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	3.42E-11	=	[	6.18E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Benzene	1.82E-12	=	[	3.28E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	2.09E-12	=	[	3.77E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	4.09E-12	=	[	7.38E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.20E-03	=	[	8.27E+03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Antimony	1.13E-07	=	[	2.91E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.71E-06	=	[	7.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Barium	3.75E-05	=	[	9.69E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Beryllium	9.11E-08	=	[	2.35E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Boron	2.49E-06	=	[	6.42E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Chromium	3.87E-06	=	[	1.00E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Cobalt	3.38E-06	=	[	8.73E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Copper	5.11E-06	=	[	1.32E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Fluoride	7.83E-07	=	[	2.02E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Iron	8.95E-03	=	[	2.31E+04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Lithium	3.58E-06	=	[	9.24E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Manganese	1.41E-04	=	[	3.64E+02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Mercury	7.98E-09	=	[	2.06E-02	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	9.80E-07	=	[	2.53E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nickel	3.80E-06	=	[	9.80E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrate	3.30E-06	=	[	8.51E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Nitrite	8.49E-07	=	[	2.19E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Selenium	7.75E-07	=	[	2.00E+00	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Strontium	1.92E-05	=	[	4.96E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	2.39E-07	=	[	6.18E-01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Vanadium	2.01E-05	=	[	5.19E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Zinc	1.76E-05	=	[	4.53E+01	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Acetone	2.39E-09	=	[	6.18E-03	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Benzene	1.27E-10	=	[	3.28E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Styrene	1.46E-10	=	[	3.77E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]
Toluene	2.86E-10	=	[	7.38E-04	x	330	x	1	x	1.00E-06	x	30	x	1	]	/	[	70	x	365	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.75E-04	=	[	2.5E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Antimony	3.43E-08	=	[	8.8E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Arsenic	8.25E-07	=	[	2.1E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Barium	1.14E-05	=	[	2.9E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Beryllium	2.77E-08	=	[	7.1E-05	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Boron	7.57E-07	=	[	1.9E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Chromium	1.18E-06	=	[	3.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-06	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Copper	1.56E-06	=	[	4.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Fluoride	2.38E-07	=	[	6.1E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Iron	2.72E-03	=	[	7.0E+00	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Lithium	1.09E-06	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Manganese	4.29E-05	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Mercury	2.43E-09	=	[	6.2E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Molybdenum	2.98E-07	=	[	7.6E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nickel	1.16E-06	=	[	3.0E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrate	1.00E-06	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Nitrite	2.58E-07	=	[	6.6E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Selenium	2.36E-07	=	[	6.0E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Strontium	5.85E-06	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Total Uranium	7.28E-08	=	[	1.9E-04	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Vanadium	6.12E-06	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Zinc	5.34E-06	=	[	1.4E-02	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Acetone	7.26E-10	=	[	1.9E-06	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Benzene	3.86E-11	=	[	9.9E-08	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Styrene	4.44E-11	=	[	1.1E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]
Toluene	8.69E-11	=	[	2.2E-07	x	30	x	8.0	x	1	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.82E-02	=	[	2.5E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Antimony	2.40E-06	=	[	8.8E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Arsenic	5.78E-05	=	[	2.1E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Barium	8.00E-04	=	[	2.9E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Beryllium	1.94E-06	=	[	7.1E-05	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Boron	5.30E-05	=	[	1.9E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Chromium	8.25E-05	=	[	3.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Cobalt	7.20E-05	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Copper	1.09E-04	=	[	4.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Fluoride	1.67E-05	=	[	6.1E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Iron	1.91E-01	=	[	7.0E+00	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Lithium	7.63E-05	=	[	2.8E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Manganese	3.00E-03	=	[	1.1E-01	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Mercury	1.70E-07	=	[	6.2E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Molybdenum	2.09E-05	=	[	7.6E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nickel	8.09E-05	=	[	3.0E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrate	7.02E-05	=	[	2.6E-03	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Nitrite	1.81E-05	=	[	6.6E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Selenium	1.65E-05	=	[	6.0E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Strontium	4.09E-04	=	[	1.5E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Total Uranium	5.10E-06	=	[	1.9E-04	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Vanadium	4.28E-04	=	[	1.6E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Zinc	3.74E-04	=	[	1.4E-02	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Acetone	5.08E-08	=	[	1.9E-06	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Benzene	2.71E-09	=	[	9.9E-08	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Styrene	3.11E-09	=	[	1.1E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]
Toluene	6.09E-09	=	[	2.2E-07	x	30	x	8.0	x	1	]	/	[(	365	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Construction Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Arsenic	3.49E-09	=	[	7.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,300	x	0.3	x	0	x	1	x	30	x	1	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Arsenic	2.44E-07	=	[	7.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0.03	x	1	x	30	x	1	]	/	[	70	x	365	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,300	x	0.3	x		x	1	x	30	x	1	]	/	[	70	x	365	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,300	x	0.3	x	0.00	x	1	x	30	x	1	]	/	[	70	x	365	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Construction Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.58E-05	x	0.00E+00	=	0.00E+00	3.20E-03	/	1.00E+00	=	3.20E-03
Antimony	1.61E-09	x	0.00E+00	=	0.00E+00	1.13E-07	/	4.00E-04	=	2.82E-04
Arsenic	3.87E-08	x	1.50E+00	=	5.81E-08	2.71E-06	/	3.00E-04	=	9.04E-03
Barium	5.36E-07	x	0.00E+00	=	0.00E+00	3.75E-05	/	2.00E-01	=	1.88E-04
Beryllium	1.30E-09	x	0.00E+00	=	0.00E+00	9.11E-08	/	2.00E-03	=	4.55E-05
Boron	3.55E-08	x	0.00E+00	=	0.00E+00	2.49E-06	/	2.00E-01	=	1.24E-05
Chromium	5.54E-08	x	0.00E+00	=	0.00E+00	3.87E-06	/	3.00E-03	=	1.29E-03
Cobalt	4.83E-08	x	0.00E+00	=	0.00E+00	3.38E-06	/	3.00E-04	=	1.13E-02
Copper	7.31E-08	x	0.00E+00	=	0.00E+00	5.11E-06	/	4.00E-02	=	1.28E-04
Fluoride	1.12E-08	x	0.00E+00	=	0.00E+00	7.83E-07	/	4.00E-02	=	1.96E-05
Iron	1.28E-04	x	0.00E+00	=	0.00E+00	8.95E-03	/	7.00E-01	=	1.28E-02
Lithium	5.11E-08	x	0.00E+00	=	0.00E+00	3.58E-06	/	2.00E-03	=	1.79E-03
Manganese	2.01E-06	x	0.00E+00	=	0.00E+00	1.41E-04	/	1.40E-01	=	1.01E-03
Mercury	1.14E-10	x	0.00E+00	=	0.00E+00	7.98E-09	/	0.00E+00	=	NA
Molybdenum	1.40E-08	x	0.00E+00	=	0.00E+00	9.80E-07	/	5.00E-03	=	1.96E-04
Nickel	5.42E-08	x	0.00E+00	=	0.00E+00	3.80E-06	/	2.00E-02	=	1.90E-04
Nitrate	4.71E-08	x	0.00E+00	=	0.00E+00	3.30E-06	/	1.60E+00	=	2.06E-06
Nitrite	1.21E-08	x	0.00E+00	=	0.00E+00	8.49E-07	/	1.00E-01	=	8.49E-06
Selenium	1.11E-08	x	0.00E+00	=	0.00E+00	7.75E-07	/	5.00E-03	=	1.55E-04
Strontium	2.75E-07	x	0.00E+00	=	0.00E+00	1.92E-05	/	6.00E-01	=	3.20E-05
Total Uranium	3.42E-09	x	0.00E+00	=	0.00E+00	2.39E-07	/	3.00E-03	=	7.98E-05
Vanadium	2.87E-07	x	0.00E+00	=	0.00E+00	2.01E-05	/	5.00E-03	=	4.02E-03
Zinc	2.51E-07	x	0.00E+00	=	0.00E+00	1.76E-05	/	3.00E-01	=	5.85E-05
Acetone	3.42E-11	x	0.00E+00	=	0.00E+00	2.39E-09	/	9.00E-01	=	2.66E-09
Benzene	1.82E-12	x	5.50E-02	=	9.99E-14	1.27E-10	/	4.00E-03	=	3.18E-08
Styrene	2.09E-12	x	0.00E+00	=	0.00E+00	1.46E-10	/	2.00E-01	=	7.30E-10
Toluene	4.09E-12	x	0.00E+00	=	0.00E+00	2.86E-10	/	8.00E-02	=	3.57E-09
			Pathway total	=	5.81E-08			Pathway total	=	4.58E-02

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.75E-04	x		=	NA	6.82E-02	/[	5.00E-03	x	1000	]=	1.36E-02
Antimony	3.43E-08	x		=	NA	2.40E-06	/[		x	1000	]=	NA
Arsenic	8.25E-07	x	4.30E-03	=	3.55E-09	5.78E-05	/[	1.50E-05	x	1000	]=	3.85E-03
Barium	1.14E-05	x		=	NA	8.00E-04	/[	5.00E-04	x	1000	]=	1.60E-03
Beryllium	2.77E-08	x	2.40E-03	=	6.65E-11	1.94E-06	/[	2.00E-05	x	1000	]=	9.70E-05
Boron	7.57E-07	x	0.00E+00	=	0.00E+00	5.30E-05	/[	2.00E-02	x	1000	]=	2.65E-06
Chromium	1.18E-06	x	8.40E-02	=	9.90E-08	8.25E-05	/[	1.00E-04	x	1000	]=	8.25E-04
Cobalt	1.03E-06	x	9.00E-03	=	9.26E-09	7.20E-05	/[	6.00E-06	x	1000	]=	1.20E-02
Copper	1.56E-06	x		=	NA	1.09E-04	/[		x	1000	]=	NA
Fluoride	2.38E-07	x		=	NA	1.67E-05	/[	1.30E-02	x	1000	]=	1.28E-06
Iron	2.72E-03	x		=	NA	1.91E-01	/[		x	1000	]=	NA
Lithium	1.09E-06	x		=	NA	7.63E-05	/[		x	1000	]=	NA
Manganese	4.29E-05	x		=	NA	3.00E-03	/[	5.00E-05	x	1000	]=	6.01E-02
Mercury	2.43E-09	x	0.00E+00	=	0.00E+00	1.70E-07	/[	3.00E-04	x	1000	]=	5.67E-07
Molybdenum	2.98E-07	x	0.00E+00	=	0.00E+00	2.09E-05	/[	0.00E+00	x	1000	]=	NA
Nickel	1.16E-06	x	2.60E-04	=	3.00E-10	8.09E-05	/[	9.00E-05	x	1000	]=	8.99E-04
Nitrate	1.00E-06	x		=	NA	7.02E-05	/[		x	1000	]=	NA
Nitrite	2.58E-07	x		=	NA	1.81E-05	/[		x	1000	]=	NA
Selenium	2.36E-07	x	0.00E+00	=	0.00E+00	1.65E-05	/[	2.00E-02	x	1000	]=	8.25E-07
Strontium	5.85E-06	x		=	NA	4.09E-04	/[		x	1000	]=	NA
Total Uranium	7.28E-08	x		=	NA	5.10E-06	/[	4.00E-05	x	1000	]=	1.27E-04
Vanadium	6.12E-06	x		=	NA	4.28E-04	/[	1.00E-04	x	1000	]=	4.28E-03
Zinc	5.34E-06	x		=	NA	3.74E-04	/[		x	1000	]=	NA
Acetone	7.26E-10	x	0.00E+00	=	0.00E+00	5.08E-08	/[	3.10E+01	x	1000	]=	1.64E-12
Benzene	3.86E-11	x	7.80E-06	=	3.01E-16	2.71E-09	/[	3.00E-02	x	1000	]=	9.02E-11
Styrene	4.44E-11	x	0.00E+00	=	0.00E+00	3.11E-09	/[	1.00E+00	x	1000	]=	3.11E-12
Toluene	8.69E-11	x	0.00E+00	=	0.00E+00	6.09E-09	/[	5.00E+00	x	1000	]=	1.22E-12
			Pathway total =		1.12E-07					Pathway total =		9.74E-02

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.49E-09	x	1.50E+00	=	5.23E-09	2.44E-07	/	3.00E-04	=	8.14E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		5.23E-09			Pathway total =		8.14E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Arsenic	Sum of all pathways	=	6.69E-08	Sum of all pathways	=	1.4E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Beryllium	Sum of all pathways	=	6.65E-11	Sum of all pathways	=	1.4E-04
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Chromium	Sum of all pathways	=	9.90E-08	Sum of all pathways	=	2.1E-03
Cobalt	Sum of all pathways	=	9.26E-09	Sum of all pathways	=	2.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-02
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.7E-07
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Nickel	Sum of all pathways	=	3.00E-10	Sum of all pathways	=	1.1E-03
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.5E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-09
Benzene	Sum of all pathways	=	1.00E-13	Sum of all pathways	=	3.2E-08
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	1.76E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.44E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for CERCLA Constuction Worker Scenario

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	3E-08	2E-07	4E-08	3E-08	4E-08	7E-08	3E-08	4E-08	5E-08	6E-08
Inhalation	1E-07	1E-07	2E-07	1E-07	2E-07	1E-07	1E-07	1E-07	1E-07	1E-07
Dermal Contact	3E-09	2E-08	4E-09	3E-09	4E-09	6E-09	3E-09	4E-09	4E-09	5E-09
ELCR	1E-07	3E-07	2E-07	1E-07	2E-07	2E-07	1E-07	2E-07	2E-07	2E-07
Major Risk Contributors	None									
	Noncancer Hazard - Nonradiological COPCs									
Soil Ingestion	0.04	0.07	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05
Inhalation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dermal Contact	5E-04	2E-03	8E-04	4E-04	6E-04	9E-04	4E-04	6E-04	8E-04	8E-04
HI	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1
Major Hazard Contributors	None									

Appendix C

Attachment C-4: Results of Nonradiological Risk Assessment under Maintenance/ Surveillance Worker Scenario

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Unit, Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.44E-03	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	5.04E-08	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	7.13E-07	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.62E-05	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	1.84E-08	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	1.81E-06	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.73E-06	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.42E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	4.23E-07	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.58E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.58E-06	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	6.73E-05	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.06E-06	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	1.72E-06	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	1.76E-07	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	9.18E-09	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	7.17E-06	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Tin	2.21E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.10E-07	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.14E-05	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	8.67E-06	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Diethylphthalate	6.46E-08	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1254	1.43E-09	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.02E-03	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.41E-07	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.00E-06	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.52E-05	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	5.15E-08	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	5.08E-06	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.84E-06	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	6.79E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.18E-06	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.28E-02	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.43E-06	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	1.88E-04	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	5.77E-06	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	4.82E-06	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	4.93E-07	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	2.57E-08	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	2.01E-05	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Tin	6.17E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.07E-07	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.19E-05	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.43E-05	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Diethylphthalate	1.81E-07	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1254	4.01E-09	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Unit, Area C

Equation	**EC**	**=**	**[**	**CA**	**x**	**EF**	**x**	**ET**	**x**	**ED**	**]**	**/**	**[(**	**AT**	**x**	**CF2**	**)]**
Units	**ug/m³**			**ug/m³**		**days/year**		**hrs/day**		**years**				**days**		**hrs/day**	

CARCINOGENIC EFFECTS

Aluminum	4.59E-06	=	[	1.0E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.61E-10	=	[	3.6E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	2.28E-09	=	[	5.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	5.17E-08	=	[	1.2E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	5.88E-11	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	5.79E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.53E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	7.75E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.35E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.46E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.06E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.15E-07	=	[	4.8E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	6.59E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	5.51E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	5.62E-10	=	[	1.3E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	2.93E-11	=	[	6.6E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.29E-08	=	[	5.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	7.05E-09	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	3.51E-10	=	[	7.9E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.64E-08	=	[	8.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.77E-08	=	[	6.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Diethylphthalate	2.07E-10	=	[	4.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1254	4.58E-12	=	[	1.0E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.28E-05	=	[	1.0E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.51E-10	=	[	3.6E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	6.38E-09	=	[	5.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.45E-07	=	[	1.2E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.65E-10	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.62E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.55E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.17E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	3.79E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.10E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.42E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.02E-07	=	[	4.8E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	1.84E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.54E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	1.57E-09	=	[	1.3E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	8.21E-11	=	[	6.6E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	6.42E-08	=	[	5.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	1.97E-08	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	9.82E-10	=	[	7.9E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.02E-07	=	[	8.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	7.76E-08	=	[	6.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Diethylphthalate	5.78E-10	=	[	4.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1254	1.28E-11	=	[	1.0E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	7.06E-08	=	[	3.75E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	6.07E-11	=	[	9.67E-02	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Diethylphthalate	2.13E-08	=	[	3.40E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1254	6.62E-10	=	[	7.54E-03	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.98E-07	=	[	3.75E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	1.70E-10	=	[	9.67E-02	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Diethylphthalate	5.97E-08	=	[	3.40E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1254	1.85E-09	=	[	7.54E-03	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.44E-03	x	0.00E+00	=	0.00E+00	4.02E-03	/	1.00E+00	=	4.02E-03
Antimony	5.04E-08	x	0.00E+00	=	0.00E+00	1.41E-07	/	4.00E-04	=	3.53E-04
Arsenic	7.13E-07	x	1.50E+00	=	1.07E-06	2.00E-06	/	3.00E-04	=	6.65E-03
Barium	1.62E-05	x	0.00E+00	=	0.00E+00	4.52E-05	/	2.00E-01	=	2.26E-04
Cadmium	1.84E-08	x	0.00E+00	=	0.00E+00	5.15E-08	/	1.00E-03	=	5.15E-05
Chromium	1.81E-06	x	0.00E+00	=	0.00E+00	5.08E-06	/	3.00E-03	=	1.69E-03
Cobalt	1.73E-06	x	0.00E+00	=	0.00E+00	4.84E-06	/	3.00E-04	=	1.61E-02
Copper	2.42E-06	x	0.00E+00	=	0.00E+00	6.79E-06	/	4.00E-02	=	1.70E-04
Fluoride	4.23E-07	x	0.00E+00	=	0.00E+00	1.18E-06	/	4.00E-02	=	2.96E-05
Iron	4.58E-03	x	0.00E+00	=	0.00E+00	1.28E-02	/	7.00E-01	=	1.83E-02
Lithium	1.58E-06	x	0.00E+00	=	0.00E+00	4.43E-06	/	2.00E-03	=	2.22E-03
Manganese	6.73E-05	x	0.00E+00	=	0.00E+00	1.88E-04	/	1.40E-01	=	1.35E-03
Nickel	2.06E-06	x	0.00E+00	=	0.00E+00	5.77E-06	/	2.00E-02	=	2.89E-04
Nitrate	1.72E-06	x	0.00E+00	=	0.00E+00	4.82E-06	/	1.60E+00	=	3.02E-06
Nitrite	1.76E-07	x	0.00E+00	=	0.00E+00	4.93E-07	/	1.00E-01	=	4.93E-06
Silver	9.18E-09	x	0.00E+00	=	0.00E+00	2.57E-08	/	5.00E-03	=	5.14E-06
Strontium	7.17E-06	x	0.00E+00	=	0.00E+00	2.01E-05	/	6.00E-01	=	3.35E-05
Tin	2.21E-06	x	0.00E+00	=	0.00E+00	6.17E-06	/	6.00E-01	=	1.03E-05
Total Uranium	1.10E-07	x	0.00E+00	=	0.00E+00	3.07E-07	/	3.00E-03	=	1.02E-04
Vanadium	1.14E-05	x	0.00E+00	=	0.00E+00	3.19E-05	/	5.00E-03	=	6.38E-03
Zinc	8.67E-06	x	0.00E+00	=	0.00E+00	2.43E-05	/	3.00E-01	=	8.09E-05
Diethylphthalate	6.46E-08	x	0.00E+00	=	0.00E+00	1.81E-07	/	8.00E-01	=	2.26E-07
Aroclor-1254	1.43E-09	x	2.00E+00	=	2.87E-09	4.01E-09	/	2.00E-05	=	2.01E-04
			Pathway total	=	1.07E-06			Pathway total	=	5.83E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.59E-06	x		=	NA	1.28E-05	/[	5.00E-03	x	1000	]=	2.57E-06
Antimony	1.61E-10	x		=	NA	4.51E-10	/[		x	1000	]=	NA
Arsenic	2.28E-09	x	4.30E-03	=	9.80E-12	6.38E-09	/[	1.50E-05	x	1000	]=	4.25E-07
Barium	5.17E-08	x		=	NA	1.45E-07	/[	5.00E-04	x	1000	]=	2.89E-07
Cadmium	5.88E-11	x	1.80E-03	=	1.06E-13	1.65E-10	/[	1.00E-05	x	1000	]=	1.65E-08
Chromium	5.79E-09	x	8.40E-02	=	4.87E-10	1.62E-08	/[	1.00E-04	x	1000	]=	1.62E-07
Cobalt	5.53E-09	x	9.00E-03	=	4.97E-11	1.55E-08	/[	6.00E-06	x	1000	]=	2.58E-06
Copper	7.75E-09	x		=	NA	2.17E-08	/[		x	1000	]=	NA
Fluoride	1.35E-09	x		=	NA	3.79E-09	/[	1.30E-02	x	1000	]=	2.91E-10
Iron	1.46E-05	x		=	NA	4.10E-05	/[		x	1000	]=	NA
Lithium	5.06E-09	x		=	NA	1.42E-08	/[		x	1000	]=	NA
Manganese	2.15E-07	x		=	NA	6.02E-07	/[	5.00E-05	x	1000	]=	1.20E-05
Nickel	6.59E-09	x	2.60E-04	=	1.71E-12	1.84E-08	/[	9.00E-05	x	1000	]=	2.05E-07
Nitrate	5.51E-09	x		=	NA	1.54E-08	/[		x	1000	]=	NA
Nitrite	5.62E-10	x		=	NA	1.57E-09	/[		x	1000	]=	NA
Silver	2.93E-11	x		=	NA	8.21E-11	/[		x	1000	]=	NA
Strontium	2.29E-08	x		=	NA	6.42E-08	/[		x	1000	]=	NA
Tin	7.05E-09	x		=	NA	1.97E-08	/[		x	1000	]=	NA
Total Uranium	3.51E-10	x		=	NA	9.82E-10	/[	4.00E-05	x	1000	]=	2.46E-08
Vanadium	3.64E-08	x		=	NA	1.02E-07	/[	1.00E-04	x	1000	]=	1.02E-06
Zinc	2.77E-08	x		=	NA	7.76E-08	/[		x	1000	]=	NA
Diethylphthalate	2.07E-10	x		=	NA	5.78E-10	/[		x	1000	]=	NA
Aroclor-1254	4.58E-12	x	5.70E-04	=	2.61E-15	1.28E-11	/[		x	1000	]=	NA
			Pathway total =		5.48E-10					Pathway total =		1.93E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.06E-08	x	1.50E+00	=	1.06E-07	1.98E-07	/	3.00E-04	=	6.59E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	6.07E-11	x		=	NA	1.70E-10	/	2.50E-05	=	6.80E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	2.13E-08	x		=	NA	5.97E-08	/	8.00E-01	=	7.47E-08
Aroclor-1254	6.62E-10	x	2.00E+00	=	1.32E-09	1.85E-09	/	2.00E-05	=	9.27E-05
			Pathway total =		1.07E-07			Pathway total =		7.58E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-04
Arsenic	Sum of all pathways	=	1.18E-06	Sum of all pathways	=	7.3E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Cadmium	Sum of all pathways	=	1.06E-13	Sum of all pathways	=	5.8E-05
Chromium	Sum of all pathways	=	4.87E-10	Sum of all pathways	=	1.7E-03
Cobalt	Sum of all pathways	=	4.97E-11	Sum of all pathways	=	1.6E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Nickel	Sum of all pathways	=	1.71E-12	Sum of all pathways	=	2.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-05
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-07
Aroclor-1254	Sum of all pathways	=	4.19E-09	Sum of all pathways	=	2.9E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.18E-06	All Pathways and Chemicals	=	5.91E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.81E-03	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	1.37E-07	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	4.03E-06	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.88E-05	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	7.66E-08	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.85E-08	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	2.43E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	2.09E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	3.44E-06	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	4.35E-07	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	5.44E-03	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	2.30E-06	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	8.54E-05	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	9.62E-10	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.47E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	3.31E-06	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	4.01E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.52E-08	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	8.50E-06	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.61E-07	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.49E-05	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	9.71E-06	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.53E-08	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	5.06E-03	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	3.84E-07	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.13E-05	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	5.26E-05	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	2.15E-07	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	7.98E-08	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	6.81E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	5.86E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	9.63E-06	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.22E-06	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.52E-02	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	6.44E-06	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.39E-04	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	2.69E-09	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	6.92E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	9.26E-06	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	1.12E-06	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	4.26E-08	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	2.38E-05	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	4.50E-07	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	4.18E-05	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.72E-05	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	4.30E-08	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.78E-06	=	[	1.3E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	4.38E-10	=	[	9.9E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	1.29E-08	=	[	2.9E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	6.00E-08	=	[	1.4E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	2.45E-10	=	[	5.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	9.11E-11	=	[	2.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	7.78E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	6.68E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.10E-08	=	[	2.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.39E-09	=	[	3.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.74E-05	=	[	3.9E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	7.35E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.73E-07	=	[	6.2E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	3.07E-12	=	[	6.9E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	7.90E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.06E-08	=	[	2.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.28E-09	=	[	2.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	4.86E-11	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.72E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	5.14E-10	=	[	1.2E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	4.77E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	3.11E-08	=	[	7.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.90E-11	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.62E-05	=	[	1.3E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	1.23E-09	=	[	9.9E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	3.61E-08	=	[	2.9E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.68E-07	=	[	1.4E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	6.86E-10	=	[	5.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	2.55E-10	=	[	2.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.18E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.87E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	3.08E-08	=	[	2.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	3.90E-09	=	[	3.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.87E-05	=	[	3.9E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	2.06E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	7.64E-07	=	[	6.2E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	8.61E-12	=	[	6.9E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	2.21E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	2.96E-08	=	[	2.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	3.59E-09	=	[	2.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.36E-10	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	7.61E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.44E-09	=	[	1.2E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.34E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	8.69E-08	=	[	7.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.37E-10	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	3.99E-07	=	[	2.12E+01	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	9.41E-11	=	[	1.50E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.06E-09	=	[	8.07E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.12E-06	=	[	2.12E+01	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	2.63E-10	=	[	1.50E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.42E-08	=	[	8.07E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.81E-03	x	0.00E+00	=	0.00E+00	5.06E-03	/	1.00E+00	=	5.06E-03
Antimony	1.37E-07	x	0.00E+00	=	0.00E+00	3.84E-07	/	4.00E-04	=	9.59E-04
Arsenic	4.03E-06	x	1.50E+00	=	6.05E-06	1.13E-05	/	3.00E-04	=	3.76E-02
Barium	1.88E-05	x	0.00E+00	=	0.00E+00	5.26E-05	/	2.00E-01	=	2.63E-04
Beryllium	7.66E-08	x	0.00E+00	=	0.00E+00	2.15E-07	/	2.00E-03	=	1.07E-04
Cadmium	2.85E-08	x	0.00E+00	=	0.00E+00	7.98E-08	/	1.00E-03	=	7.98E-05
Chromium	2.43E-06	x	0.00E+00	=	0.00E+00	6.81E-06	/	3.00E-03	=	2.27E-03
Cobalt	2.09E-06	x	0.00E+00	=	0.00E+00	5.86E-06	/	3.00E-04	=	1.95E-02
Copper	3.44E-06	x	0.00E+00	=	0.00E+00	9.63E-06	/	4.00E-02	=	2.41E-04
Fluoride	4.35E-07	x	0.00E+00	=	0.00E+00	1.22E-06	/	4.00E-02	=	3.05E-05
Iron	5.44E-03	x	0.00E+00	=	0.00E+00	1.52E-02	/	7.00E-01	=	2.17E-02
Lithium	2.30E-06	x	0.00E+00	=	0.00E+00	6.44E-06	/	2.00E-03	=	3.22E-03
Manganese	8.54E-05	x	0.00E+00	=	0.00E+00	2.39E-04	/	1.40E-01	=	1.71E-03
Mercury	9.62E-10	x	0.00E+00	=	0.00E+00	2.69E-09	/	0.00E+00	=	NA
Nickel	2.47E-06	x	0.00E+00	=	0.00E+00	6.92E-06	/	2.00E-02	=	3.46E-04
Nitrate	3.31E-06	x	0.00E+00	=	0.00E+00	9.26E-06	/	1.60E+00	=	5.79E-06
Nitrite	4.01E-07	x	0.00E+00	=	0.00E+00	1.12E-06	/	1.00E-01	=	1.12E-05
Silver	1.52E-08	x	0.00E+00	=	0.00E+00	4.26E-08	/	5.00E-03	=	8.52E-06
Strontium	8.50E-06	x	0.00E+00	=	0.00E+00	2.38E-05	/	6.00E-01	=	3.97E-05
Total Uranium	1.61E-07	x	0.00E+00	=	0.00E+00	4.50E-07	/	3.00E-03	=	1.50E-04
Vanadium	1.49E-05	x	0.00E+00	=	0.00E+00	4.18E-05	/	5.00E-03	=	8.36E-03
Zinc	9.71E-06	x	0.00E+00			2.72E-05	/	3.00E-01	=	9.07E-05
Butylbenzylphthalate	1.53E-08	x	1.90E-03	=	2.91E-11	4.30E-08	/	2.00E-01	=	2.15E-07
			Pathway total	=	6.05E-06			Pathway total	=	1.02E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	5.78E-06	x		=	NA	1.62E-05	/[	5.00E-03	x	1000	]=	3.24E-06
Antimony	4.38E-10	x		=	NA	1.23E-09	/[		x	1000	]=	NA
Arsenic	1.29E-08	x	4.30E-03	=	5.54E-11	3.61E-08	/[	1.50E-05	x	1000	]=	2.40E-06
Barium	6.00E-08	x		=	NA	1.68E-07	/[	5.00E-04	x	1000	]=	3.36E-07
Beryllium	2.45E-10	x	2.40E-03	=	5.88E-13	6.86E-10	/[	2.00E-05	x	1000	]=	3.43E-08
Cadmium	9.11E-11	x	1.80E-03	=	1.64E-13	2.55E-10	/[	1.00E-05	x	1000	]=	2.55E-08
Chromium	7.78E-09	x	8.40E-02	=	6.53E-10	2.18E-08	/[	1.00E-04	x	1000	]=	2.18E-07
Cobalt	6.68E-09	x	9.00E-03	=	6.02E-11	1.87E-08	/[	6.00E-06	x	1000	]=	3.12E-06
Copper	1.10E-08	x		=	NA	3.08E-08	/[		x	1000	]=	NA
Fluoride	1.39E-09	x		=	NA	3.90E-09	/[	1.30E-02	x	1000	]=	3.00E-10
Iron	1.74E-05	x		=	NA	4.87E-05	/[		x	1000	]=	NA
Lithium	7.35E-09	x		=	NA	2.06E-08	/[		x	1000	]=	NA
Manganese	2.73E-07	x		=	NA	7.64E-07	/[	5.00E-05	x	1000	]=	1.53E-05
Mercury	3.07E-12	x	0.00E+00	=	0.00E+00	8.61E-12	/[	3.00E-04	x	1000	]=	2.87E-11
Nickel	7.90E-09	x	2.60E-04	=	2.05E-12	2.21E-08	/[	9.00E-05	x	1000	]=	2.46E-07
Nitrate	1.06E-08	x		=	NA	2.96E-08	/[		x	1000	]=	NA
Nitrite	1.28E-09	x		=	NA	3.59E-09	/[		x	1000	]=	NA
Silver	4.86E-11	x		=	NA	1.36E-10	/[		x	1000	]=	NA
Strontium	2.72E-08	x		=	NA	7.61E-08	/[		x	1000	]=	NA
Total Uranium	5.14E-10	x		=	NA	1.44E-09	/[	4.00E-05	x	1000	]=	3.60E-08
Vanadium	4.77E-08	x		=	NA	1.34E-07	/[	1.00E-04	x	1000	]=	1.34E-06
Zinc	3.11E-08	x				8.69E-08	/[		x	1000	]=	NA
Butylbenzylphthalate	4.90E-11	x	0.00E+00	=	0.00E+00	1.37E-10	/		x	1000	]=	NA
			Pathway total =		7.72E-10					Pathway total =		2.63E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.99E-07	x	1.50E+00	=	5.98E-07	1.12E-06	/	3.00E-04	=	3.72E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	9.41E-11	x		=	NA	2.63E-10	/	2.50E-05	=	1.05E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	5.06E-09	x	1.90E-03	=	9.62E-12	1.42E-08	/	2.00E-01	=	7.09E-08
			Pathway total =		5.98E-07			Pathway total =		3.73E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	9.6E-04
Arsenic	Sum of all pathways	=	6.64E-06	Sum of all pathways	=	4.1E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Beryllium	Sum of all pathways	=	5.88E-13	Sum of all pathways	=	1.1E-04
Cadmium	Sum of all pathways	=	1.64E-13	Sum of all pathways	=	9.0E-05
Chromium	Sum of all pathways	=	6.53E-10	Sum of all pathways	=	2.3E-03
Cobalt	Sum of all pathways	=	6.02E-11	Sum of all pathways	=	2.0E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-11
Nickel	Sum of all pathways	=	2.05E-12	Sum of all pathways	=	3.5E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	8.5E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-05
Butylbenzylphthalate	Sum of all pathways	=	3.88E-11	Sum of all pathways	=	2.9E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	6.64E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.06E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.41E-03	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	3.38E-08	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.89E-07	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.49E-05	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	3.02E-08	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Boron	6.35E-07	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	6.20E-07	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	3.27E-06	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.68E-06	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	3.14E-06	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	2.81E-07	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.60E-03	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.74E-06	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	9.41E-05	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	4.41E-09	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.36E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	9.54E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	2.66E-07	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	1.06E-07	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.62E-08	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	6.60E-06	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.57E-07	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.12E-05	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	8.52E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	1.26E-09	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.36E-08	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	6.41E-11	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Aldrin	3.80E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.95E-03	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	9.47E-08	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.77E-06	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.17E-05	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	8.46E-08	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Boron	1.78E-06	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	1.74E-06	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	9.16E-06	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.69E-06	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	8.78E-06	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	7.88E-07	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.29E-02	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.86E-06	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.63E-04	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	1.23E-08	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	6.60E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	2.67E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	7.45E-07	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	2.98E-07	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	4.52E-08	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.85E-05	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	4.40E-07	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.13E-05	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.38E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	3.53E-09	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	6.60E-08	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	1.79E-10	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Aldrin	1.06E-09	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.51E-06	=	[	1.0E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.08E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	3.16E-09	=	[	7.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	4.76E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	9.66E-11	=	[	2.2E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	2.03E-09	=	[	4.6E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	1.98E-09	=	[	4.5E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.05E-08	=	[	2.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.36E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	1.00E-08	=	[	2.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	8.99E-10	=	[	2.0E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.47E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.55E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	3.01E-07	=	[	6.8E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.41E-11	=	[	3.2E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	7.53E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	3.05E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	8.51E-10	=	[	1.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	3.40E-10	=	[	7.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	5.16E-11	=	[	1.2E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.11E-08	=	[	4.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	5.03E-10	=	[	1.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.57E-08	=	[	8.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.72E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	4.03E-12	=	[	9.1E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.53E-11	=	[	1.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	2.05E-13	=	[	4.6E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aldrin	1.22E-12	=	[	2.7E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.26E-05	=	[	1.0E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	3.03E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	8.85E-09	=	[	7.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.33E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	2.71E-10	=	[	2.2E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	5.68E-09	=	[	4.6E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	5.55E-09	=	[	4.5E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.93E-08	=	[	2.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.50E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.81E-08	=	[	2.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	2.52E-09	=	[	2.0E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.12E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.55E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	8.42E-07	=	[	6.8E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	3.95E-11	=	[	3.2E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	2.11E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	8.54E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	2.38E-09	=	[	1.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	9.53E-10	=	[	7.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.45E-10	=	[	1.2E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	5.90E-08	=	[	4.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.41E-09	=	[	1.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.00E-07	=	[	8.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	7.62E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.13E-11	=	[	9.1E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	2.11E-10	=	[	1.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	5.73E-13	=	[	4.6E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aldrin	3.40E-12	=	[	2.7E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.79E-08	=	[	5.20E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.05E-09	=	[	3.26E+00	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	7.78E-09	=	[	1.24E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Aldrin	1.25E-10	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.74E-07	=	[	5.20E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	5.73E-09	=	[	3.26E+00	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	2.18E-08	=	[	1.24E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Aldrin	3.51E-10	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.41E-03	x	0.00E+00	=	0.00E+00	3.95E-03	/	1.00E+00	=	3.95E-03
Antimony	3.38E-08	x	0.00E+00	=	0.00E+00	9.47E-08	/	4.00E-04	=	2.37E-04
Arsenic	9.89E-07	x	1.50E+00	=	1.48E-06	2.77E-06	/	3.00E-04	=	9.23E-03
Barium	1.49E-05	x	0.00E+00	=	0.00E+00	4.17E-05	/	2.00E-01	=	2.09E-04
Beryllium	3.02E-08	x	0.00E+00	=	0.00E+00	8.46E-08	/	2.00E-03	=	4.23E-05
Boron	6.35E-07	x	0.00E+00	=	0.00E+00	1.78E-06	/	2.00E-01	=	8.89E-06
Cadmium	6.20E-07	x	0.00E+00	=	0.00E+00	1.74E-06	/	1.00E-03	=	1.74E-03
Chromium	3.27E-06	x	0.00E+00	=	0.00E+00	9.16E-06	/	3.00E-03	=	3.05E-03
Cobalt	1.68E-06	x	0.00E+00	=	0.00E+00	4.69E-06	/	3.00E-04	=	1.56E-02
Copper	3.14E-06	x	0.00E+00	=	0.00E+00	8.78E-06	/	4.00E-02	=	2.20E-04
Fluoride	2.81E-07	x	0.00E+00	=	0.00E+00	7.88E-07	/	4.00E-02	=	1.97E-05
Iron	4.60E-03	x	0.00E+00	=	0.00E+00	1.29E-02	/	7.00E-01	=	1.84E-02
Lithium	1.74E-06	x	0.00E+00	=	0.00E+00	4.86E-06	/	2.00E-03	=	2.43E-03
Manganese	9.41E-05	x	0.00E+00	=	0.00E+00	2.63E-04	/	1.40E-01	=	1.88E-03
Mercury	4.41E-09	x	0.00E+00	=	0.00E+00	1.23E-08	/	0.00E+00	=	NA
Nickel	2.36E-06	x	0.00E+00	=	0.00E+00	6.60E-06	/	2.00E-02	=	3.30E-04
Nitrate	9.54E-07	x	0.00E+00	=	0.00E+00	2.67E-06	/	1.60E+00	=	1.67E-06
Nitrite	2.66E-07	x	0.00E+00	=	0.00E+00	7.45E-07	/	1.00E-01	=	7.45E-06
Selenium	1.06E-07	x	0.00E+00	=	0.00E+00	2.98E-07	/	5.00E-03	=	5.96E-05
Silver	1.62E-08	x	0.00E+00	=	0.00E+00	4.52E-08	/	5.00E-03	=	9.05E-06
Strontium	6.60E-06	x	0.00E+00	=	0.00E+00	1.85E-05	/	6.00E-01	=	3.08E-05
Total Uranium	1.57E-07	x	0.00E+00	=	0.00E+00	4.40E-07	/	3.00E-03	=	1.47E-04
Vanadium	1.12E-05	x	0.00E+00	=	0.00E+00	3.13E-05	/	5.00E-03	=	6.26E-03
Zinc	8.52E-06	x	0.00E+00	=	0.00E+00	2.38E-05	/	3.00E-01	=	7.95E-05
Acetone	1.26E-09	x	0.00E+00	=	0.00E+00	3.53E-09	/	9.00E-01	=	3.92E-09
Butylbenzylphthalate	2.36E-08	x	1.90E-03	=	4.48E-11	6.60E-08	/	2.00E-01	=	3.30E-07
Toluene	6.41E-11	x	0.00E+00	=	0.00E+00	1.79E-10	/	8.00E-02	=	2.24E-09
Aldrin	3.80E-10	x	1.70E+01	=	6.46E-09	1.06E-09	/	3.00E-05	=	3.55E-05
			Pathway total	=	1.49E-06			Pathway total	=	6.40E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.51E-06	x		=	NA	1.26E-05	/[	5.00E-03	x	1000	]=	2.52E-06
Antimony	1.08E-10	x		=	NA	3.03E-10	/[		x	1000	]=	NA
Arsenic	3.16E-09	x	4.30E-03	=	1.36E-11	8.85E-09	/[	1.50E-05	x	1000	]=	5.90E-07
Barium	4.76E-08	x		=	NA	1.33E-07	/[	5.00E-04	x	1000	]=	2.67E-07
Beryllium	9.66E-11	x	2.40E-03	=	2.32E-13	2.71E-10	/[	2.00E-05	x	1000	]=	1.35E-08
Boron	2.03E-09	x	0.00E+00	=	0.00E+00	5.68E-09	/[	2.00E-02	x	1000	]=	2.84E-10
Cadmium	1.98E-09	x	1.80E-03	=	3.57E-12	5.55E-09	/[	1.00E-05	x	1001	]=	5.54E-07
Chromium	1.05E-08	x	8.40E-02	=	8.78E-10	2.93E-08	/[	1.00E-04	x	1002	]=	2.92E-07
Cobalt	5.36E-09	x	9.00E-03	=	4.82E-11	1.50E-08	/[	6.00E-06	x	1003	]=	2.49E-06
Copper	1.00E-08	x		=	NA	2.81E-08	/[		x	1004	]=	NA
Fluoride	8.99E-10	x		=	NA	2.52E-09	/[	1.30E-02	x	1005	]=	1.93E-10
Iron	1.47E-05	x		=	NA	4.12E-05	/[		x	1000	]=	NA
Lithium	5.55E-09	x		=	NA	1.55E-08	/[		x	1000	]=	NA
Manganese	3.01E-07	x		=	NA	8.42E-07	/[	5.00E-05	x	1000	]=	1.68E-05
Mercury	1.41E-11	x	0.00E+00	=	0.00E+00	3.95E-11	/[	3.00E-04	x	1000	]=	1.32E-10
Nickel	7.53E-09	x	2.60E-04	=	1.96E-12	2.11E-08	/[	9.00E-05	x	1000	]=	2.34E-07
Nitrate	3.05E-09	x		=	NA	8.54E-09	/[		x	1000	]=	NA
Nitrite	8.51E-10	x		=	NA	2.38E-09	/[		x	1000	]=	NA
Selenium	3.40E-10	x	0.00E+00	=	0.00E+00	9.53E-10	/[	2.00E-02	x	1000	]=	4.76E-11
Silver	5.16E-11	x		=	NA	1.45E-10	/[		x	1000	]=	NA
Strontium	2.11E-08	x		=	NA	5.90E-08	/[		x	1000	]=	NA
Total Uranium	5.03E-10	x		=	NA	1.41E-09	/[	4.00E-05	x	1000	]=	3.52E-08
Vanadium	3.57E-08	x		=	NA	1.00E-07	/[	1.00E-04	x	1000	]=	1.00E-06
Zinc	2.72E-08	x		=	NA	7.62E-08	/[		x	1000	]=	NA
Acetone	4.03E-12	x	0.00E+00	=	0.00E+00	1.13E-11	/[	3.10E+01	x	1000	]=	3.64E-16
Butylbenzylphthalate	7.53E-11	x	0.00E+00	=	0.00E+00	2.11E-10	/[		x	1000	]=	NA
Toluene	2.05E-13	x	0.00E+00	=	0.00E+00	5.73E-13	/[	5.00E+00	x	1000	]=	1.15E-16
Aldrin	1.22E-12	x	4.90E-03	=	5.95E-15	3.40E-12	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.45E-10					Pathway total =		2.48E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.79E-08	x	1.50E+00	=	1.47E-07	2.74E-07	/	3.00E-04	=	9.13E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	2.05E-09	x		=	NA	5.73E-09	/	2.50E-05	=	2.29E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	7.78E-09	x	1.90E-03	=	1.48E-11	2.18E-08	/	2.00E-01	=	1.09E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	1.25E-10	x	1.70E+01	=	2.13E-09	3.51E-10	/	3.00E-05	=	1.17E-05
			Pathway total =		1.49E-07			Pathway total =		1.15E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Arsenic	Sum of all pathways	=	1.63E-06	Sum of all pathways	=	1.0E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Beryllium	Sum of all pathways	=	2.32E-13	Sum of all pathways	=	4.2E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	8.9E-06
Cadmium	Sum of all pathways	=	3.57E-12	Sum of all pathways	=	2.0E-03
Chromium	Sum of all pathways	=	8.78E-10	Sum of all pathways	=	3.1E-03
Cobalt	Sum of all pathways	=	4.82E-11	Sum of all pathways	=	1.6E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-10
Nickel	Sum of all pathways	=	1.96E-12	Sum of all pathways	=	3.3E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-09
Butylbenzylphthalate	Sum of all pathways	=	5.96E-11	Sum of all pathways	=	4.4E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-09
Aldrin	Sum of all pathways	=	8.60E-09	Sum of all pathways	=	4.7E-05

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.64E-06	All Pathways and Chemicals	=	6.52E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.29E-03	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	4.70E-08	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	6.63E-07	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.79E-05	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	5.67E-08	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.22E-08	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	1.71E-06	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.56E-06	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.48E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	4.02E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.55E-03	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.41E-06	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	7.34E-05	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	5.78E-09	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.14E-06	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	1.36E-06	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	5.82E-07	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.56E-08	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	6.88E-06	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Tin	1.21E-06	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.36E-07	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.33E-05	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	7.29E-06	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
2-Butanone	4.72E-10	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	7.67E-07	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.13E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Hexane	6.82E-09	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	3.80E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
o-Xylene	2.43E-11	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	1.24E-10	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	1.86E-10	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Xylenes (total)	8.80E-11	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	4.80E-09	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	9.70E-10	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1260	3.92E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.60E-03	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.32E-07	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.86E-06	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	5.01E-05	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	1.59E-07	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	6.20E-08	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	4.78E-06	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.36E-06	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	6.94E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.12E-06	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.27E-02	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	3.95E-06	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.06E-04	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	1.62E-08	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	5.99E-06	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	3.81E-06	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	1.63E-06	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	4.35E-08	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.93E-05	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Tin	3.39E-06	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.81E-07	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.71E-05	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.04E-05	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
2-Butanone	1.32E-09	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	2.15E-06	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	3.15E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Hexane	1.91E-08	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	1.06E-09	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
o-Xylene	6.81E-11	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	3.48E-10	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	5.21E-10	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Xylenes (total)	2.46E-10	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	1.34E-08	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Gamma-BHC (Lindane)	2.71E-09	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1260	1.10E-08	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.11E-06	=	[	9.3E-05	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.50E-10	=	[	3.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	2.12E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	5.72E-08	=	[	1.3E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.81E-10	=	[	4.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	7.08E-11	=	[	1.6E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	5.45E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	4.97E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	7.92E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.28E-09	=	[	2.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.46E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	4.51E-09	=	[	1.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.35E-07	=	[	5.3E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.85E-11	=	[	4.2E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	6.84E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	4.35E-09	=	[	9.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.86E-09	=	[	4.2E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	4.97E-11	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.20E-08	=	[	5.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	3.86E-09	=	[	8.7E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	4.35E-10	=	[	9.8E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	4.24E-08	=	[	9.6E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.33E-08	=	[	5.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
2-Butanone	1.51E-12	=	[	3.4E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.45E-09	=	[	5.5E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	3.60E-11	=	[	8.1E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Hexane	2.18E-11	=	[	4.9E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	1.22E-12	=	[	2.7E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
o-Xylene	7.78E-14	=	[	1.8E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	3.97E-13	=	[	9.0E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	5.94E-13	=	[	1.3E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Xylenes (total)	2.81E-13	=	[	6.3E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	1.53E-11	=	[	3.5E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	3.10E-12	=	[	7.0E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1260	1.25E-11	=	[	2.8E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.15E-05	=	[	9.3E-05	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.20E-10	=	[	3.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	5.93E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.60E-07	=	[	1.3E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	5.07E-10	=	[	4.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.98E-10	=	[	1.6E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.53E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.39E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.22E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	3.59E-09	=	[	2.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.07E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.26E-08	=	[	1.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.57E-07	=	[	5.3E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	5.17E-11	=	[	4.2E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	1.91E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.22E-08	=	[	9.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	5.20E-09	=	[	4.2E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.39E-10	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	6.16E-08	=	[	5.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	1.08E-08	=	[	8.7E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.22E-09	=	[	9.8E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.19E-07	=	[	9.6E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	6.52E-08	=	[	5.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
2-Butanone	4.23E-12	=	[	3.4E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	6.86E-09	=	[	5.5E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.01E-10	=	[	8.1E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Hexane	6.11E-11	=	[	4.9E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	3.40E-12	=	[	2.7E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
o-Xylene	2.18E-13	=	[	1.8E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	1.11E-12	=	[	9.0E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.66E-12	=	[	1.3E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Xylenes (total)	7.88E-13	=	[	6.3E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	4.29E-11	=	[	3.5E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Gamma-BHC (Lindane)	8.68E-12	=	[	7.0E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1260	3.50E-11	=	[	2.8E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	6.56E-08	=	[	3.49E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	7.31E-11	=	[	1.17E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.53E-07	=	[	4.03E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.72E-09	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	1.58E-09	=	[	2.52E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.28E-10	=	[	5.10E-03	x	1.00E-06	x	3,300	x	0.1	x	0.04	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1260	1.81E-09	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.84E-07	=	[	3.49E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	2.05E-10	=	[	1.17E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	7.08E-07	=	[	4.03E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.04E-08	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	4.43E-09	=	[	2.52E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Gamma-BHC (Lindane)	3.58E-10	=	[	5.10E-03	x	1.00E-06	x	3,300	x	0.1	x	0.04	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1260	5.07E-09	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.29E-03	x	0.00E+00	=	0.00E+00	3.60E-03	/	1.00E+00	=	3.60E-03
Antimony	4.70E-08	x	0.00E+00	=	0.00E+00	1.32E-07	/	4.00E-04	=	3.29E-04
Arsenic	6.63E-07	x	1.50E+00	=	9.95E-07	1.86E-06	/	3.00E-04	=	6.19E-03
Barium	1.79E-05	x	0.00E+00	=	0.00E+00	5.01E-05	/	2.00E-01	=	2.50E-04
Beryllium	5.67E-08	x	0.00E+00	=	0.00E+00	1.59E-07	/	2.00E-03	=	7.93E-05
Cadmium	2.22E-08	x	0.00E+00	=	0.00E+00	6.20E-08	/	1.00E-03	=	6.20E-05
Chromium	1.71E-06	x	0.00E+00	=	0.00E+00	4.78E-06	/	3.00E-03	=	1.59E-03
Cobalt	1.56E-06	x	0.00E+00	=	0.00E+00	4.36E-06	/	3.00E-04	=	1.45E-02
Copper	2.48E-06	x	0.00E+00	=	0.00E+00	6.94E-06	/	4.00E-02	=	1.73E-04
Fluoride	4.02E-07	x	0.00E+00	=	0.00E+00	1.12E-06	/	4.00E-02	=	2.81E-05
Iron	4.55E-03	x	0.00E+00	=	0.00E+00	1.27E-02	/	7.00E-01	=	1.82E-02
Lithium	1.41E-06	x	0.00E+00	=	0.00E+00	3.95E-06	/	2.00E-03	=	1.98E-03
Manganese	7.34E-05	x	0.00E+00	=	0.00E+00	2.06E-04	/	1.40E-01	=	1.47E-03
Mercury	5.78E-09	x	0.00E+00	=	0.00E+00	1.62E-08	/	0.00E+00	=	NA
Nickel	2.14E-06	x	0.00E+00	=	0.00E+00	5.99E-06	/	2.00E-02	=	3.00E-04
Nitrate	1.36E-06	x	0.00E+00	=	0.00E+00	3.81E-06	/	1.60E+00	=	2.38E-06
Nitrite	5.82E-07	x	0.00E+00	=	0.00E+00	1.63E-06	/	1.00E-01	=	1.63E-05
Silver	1.56E-08	x	0.00E+00	=	0.00E+00	4.35E-08	/	5.00E-03	=	8.71E-06
Strontium	6.88E-06	x	0.00E+00	=	0.00E+00	1.93E-05	/	6.00E-01	=	3.21E-05
Tin	1.21E-06	x	0.00E+00	=	0.00E+00	3.39E-06	/	6.00E-01	=	5.64E-06
Total Uranium	1.36E-07	x	0.00E+00	=	0.00E+00	3.81E-07	/	3.00E-03	=	1.27E-04
Vanadium	1.33E-05	x	0.00E+00	=	0.00E+00	3.71E-05	/	5.00E-03	=	7.42E-03
Zinc	7.29E-06	x	0.00E+00	=	0.00E+00	2.04E-05	/	3.00E-01	=	6.80E-05
2-Butanone	4.72E-10	x	0.00E+00	=	0.00E+00	1.32E-09	/	6.00E-01	=	2.20E-09
Bis(2-ethylhexyl) phthalate	7.67E-07	x	1.40E-02	=	1.07E-08	2.15E-06	/	2.00E-02	=	1.07E-04
Butylbenzylphthalate	1.13E-08	x	1.90E-03	=	2.14E-11	3.15E-08	/	2.00E-01	=	1.58E-07
Hexane	6.82E-09	x	0.00E+00	=	0.00E+00	1.91E-08	/	6.00E-02	=	3.18E-07
Methylene chloride	3.80E-10	x	2.00E-03	=	7.60E-13	1.06E-09	/	6.00E-03	=	1.77E-07
o-Xylene	2.43E-11	x	0.00E+00	=	0.00E+00	6.81E-11	/	2.00E-01	=	3.41E-10
Styrene	1.24E-10	x	0.00E+00	=	0.00E+00	3.48E-10	/	2.00E-01	=	1.74E-09
Toluene	1.86E-10	x	0.00E+00	=	0.00E+00	5.21E-10	/	8.00E-02	=	6.51E-09
Xylenes (total)	8.80E-11	x	0.00E+00	=	0.00E+00	2.46E-10	/	2.00E-01	=	1.23E-09
beta-BHC	4.80E-09	x	1.80E+00	=	8.64E-09	1.34E-08	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	9.70E-10	x	1.10E+00	=	1.07E-09	2.71E-09	/	3.00E-04	=	9.05E-06
Aroclor-1260	3.92E-09	x	2.00E+00	=	7.83E-09	1.10E-08	/	0.00E+00	=	NA
			Pathway total	=	1.02E-06			Pathway total	=	5.66E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	Unit Risk	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	4.11E-06	x		=	NA	1.15E-05	/[	5.00E-03	x	1000	]=	2.30E-06
Antimony	1.50E-10	x		=	NA	4.20E-10	/[		x	1000	]=	NA
Arsenic	2.12E-09	x	4.30E-03	=	9.11E-12	5.93E-09	/[	1.50E-05	x	1000	]=	3.96E-07
Barium	5.72E-08	x		=	NA	1.60E-07	/[	5.00E-04	x	1000	]=	3.20E-07
Beryllium	1.81E-10	x	2.40E-03	=	4.35E-13	5.07E-10	/[	2.00E-05	x	1000	]=	2.54E-08
Cadmium	7.08E-11	x	1.80E-03	=	1.27E-13	1.98E-10	/[	1.00E-05	x	1000	]=	1.98E-08
Chromium	5.45E-09	x	8.40E-02	=	4.58E-10	1.53E-08	/[	1.00E-04	x	1000	]=	1.53E-07
Cobalt	4.97E-09	x	9.00E-03	=	4.48E-11	1.39E-08	/[	6.00E-06	x	1000	]=	2.32E-06
Copper	7.92E-09	x		=	NA	2.22E-08	/[		x	1000	]=	NA
Fluoride	1.28E-09	x		=	NA	3.59E-09	/[	1.30E-02	x	1000	]=	2.76E-10
Iron	1.46E-05	x		=	NA	4.07E-05	/[		x	1000	]=	NA
Lithium	4.51E-09	x		=	NA	1.26E-08	/[		x	1000	]=	NA
Manganese	2.35E-07	x		=	NA	6.57E-07	/[	5.00E-05	x	1000	]=	1.31E-05
Mercury	1.85E-11	x	0.00E+00	=	0.00E+00	5.17E-11	/[	3.00E-04	x	1000	]=	1.72E-10
Nickel	6.84E-09	x	2.60E-04	=	1.78E-12	1.91E-08	/[	9.00E-05	x	1000	]=	2.13E-07
Nitrate	4.35E-09	x		=	NA	1.22E-08	/[		x	1000	]=	NA
Nitrite	1.86E-09	x		=	NA	5.20E-09	/[		x	1000	]=	NA
Silver	4.97E-11	x		=	NA	1.39E-10	/[		x	1000	]=	NA
Strontium	2.20E-08	x		=	NA	6.16E-08	/[		x	1000	]=	NA
Tin	3.86E-09	x		=	NA	1.08E-08	/[		x	1000	]=	NA
Total Uranium	4.35E-10	x		=	NA	1.22E-09	/[	4.00E-05	x	1000	]=	3.04E-08
Vanadium	4.24E-08	x		=	NA	1.19E-07	/[	1.00E-04	x	1000	]=	1.19E-06
Zinc	2.33E-08	x		=	NA	6.52E-08	/[		x	1000	]=	NA
2-Butanone	1.51E-12	x	0.00E+00	=	0.00E+00	4.23E-12	/[	5.00E+00	x	1000	]=	8.46E-16
Bis(2-ethylhexyl) phthalate	2.45E-09	x	2.40E-06	=	5.88E-15	6.86E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	3.60E-11	x	0.00E+00	=	0.00E+00	1.01E-10	/[		x	1000	]=	NA
Hexane	2.18E-11	x	0.00E+00	=	0.00E+00	6.11E-11	/[	7.00E-01	x	1000	]=	8.73E-14
Methylene chloride	1.22E-12	x	1.00E-08	=	1.22E-20	3.40E-12	/[	6.00E-01	x	1000	]=	5.67E-15
o-Xylene	7.78E-14	x	0.00E+00	=	0.00E+00	2.18E-13	/[	1.00E-01	x	1000	]=	2.18E-15
Styrene	3.97E-13	x	0.00E+00	=	0.00E+00	1.11E-12	/[	1.00E+00	x	1000	]=	1.11E-15
Toluene	5.94E-13	x	0.00E+00	=	0.00E+00	1.66E-12	/[	5.00E+00	x	1000	]=	3.33E-16
Xylenes (total)	2.81E-13	x	0.00E+00	=	0.00E+00	7.88E-13	/[	1.00E-01	x	1000	]=	7.88E-15
beta-BHC	1.53E-11	x	5.30E-04	=	8.13E-15	4.29E-11	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	3.10E-12	x	3.10E-04	=	9.61E-16	8.68E-12	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.25E-11	x	5.70E-04	=	7.13E-15	3.50E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		5.14E-10					Pathway total =		2.01E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.56E-08	x	1.50E+00	=	9.85E-08	1.84E-07	/	3.00E-04	=	6.13E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.31E-11	x		=	NA	2.05E-10	/	2.50E-05	=	8.19E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	2.53E-07	x	1.40E-02	=	3.54E-09	7.08E-07	/	2.00E-02	=	3.54E-05
Butylbenzylphthalate	3.72E-09	x	1.90E-03	=	7.06E-12	1.04E-08	/	2.00E-01	=	5.20E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	1.58E-09	x	1.80E+00	=	2.85E-09	4.43E-09	/		=	NA
Gamma-BHC (Lindane)	1.28E-10	x	1.10E+00	=	1.41E-10	3.58E-10	/	3.00E-04	=	1.19E-06
Aroclor-1260	1.81E-09	x	2.00E+00	=	3.62E-09	5.07E-09	/		=	NA
			Pathway total =		1.09E-07			Pathway total =		6.57E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-04
Arsenic	Sum of all pathways	=	1.09E-06	Sum of all pathways	=	6.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Beryllium	Sum of all pathways	=	4.35E-13	Sum of all pathways	=	7.9E-05
Cadmium	Sum of all pathways	=	1.27E-13	Sum of all pathways	=	7.0E-05
Chromium	Sum of all pathways	=	4.58E-10	Sum of all pathways	=	1.6E-03
Cobalt	Sum of all pathways	=	4.48E-11	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-10
Nickel	Sum of all pathways	=	1.78E-12	Sum of all pathways	=	3.0E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	5.6E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-05
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.43E-08	Sum of all pathways	=	1.4E-04
Butylbenzylphthalate	Sum of all pathways	=	2.85E-11	Sum of all pathways	=	2.1E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-07
Methylene chloride	Sum of all pathways	=	7.60E-13	Sum of all pathways	=	1.8E-07
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-10
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-09
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-09
beta-BHC	Sum of all pathways	=	1.15E-08	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	1.21E-09	Sum of all pathways	=	1.0E-05
Aroclor-1260	Sum of all pathways	=	1.15E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.13E-06	All Pathways and Chemicals	=	5.73E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.33E-03	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	4.86E-08	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.54E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.72E-05	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	3.78E-08	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.61E-08	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	3.19E-06	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.94E-06	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.32E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	3.15E-07	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.96E-03	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.44E-06	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	7.76E-05	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	3.80E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.49E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	6.17E-06	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	2.47E-07	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	1.87E-07	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.24E-08	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	6.35E-06	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.04E-07	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.26E-05	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	8.51E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.80E-08	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.08E-07	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	7.49E-11	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	1.18E-10	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.73E-03	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.36E-07	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.67E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.82E-05	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	1.06E-07	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	7.32E-08	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	8.94E-06	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	5.42E-06	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	6.49E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	8.82E-07	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.39E-02	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.03E-06	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.17E-04	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	1.06E-06	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	6.96E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	1.73E-05	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	6.92E-07	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	5.23E-07	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	3.49E-08	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.78E-05	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	2.90E-07	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.52E-05	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.38E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.06E-07	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Di-n-butylphthalate	3.03E-07	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	2.10E-10	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	3.29E-10	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.26E-06	=	[	9.6E-05	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.55E-10	=	[	3.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	3.05E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	5.50E-08	=	[	1.2E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.21E-10	=	[	2.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	8.35E-11	=	[	1.9E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	1.02E-08	=	[	2.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	6.19E-09	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	7.41E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.01E-09	=	[	2.3E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.59E-05	=	[	3.6E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	4.60E-09	=	[	1.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.48E-07	=	[	5.6E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	1.22E-09	=	[	2.7E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	7.95E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	1.97E-08	=	[	4.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	7.90E-10	=	[	1.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	5.97E-10	=	[	1.3E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	3.98E-11	=	[	9.0E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.03E-08	=	[	4.6E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	3.31E-10	=	[	7.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	4.02E-08	=	[	9.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.72E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.22E-10	=	[	2.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	3.46E-10	=	[	7.8E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	2.39E-13	=	[	5.4E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	3.76E-13	=	[	8.5E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.19E-05	=	[	9.6E-05	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.35E-10	=	[	3.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	8.54E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.54E-07	=	[	1.2E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	3.38E-10	=	[	2.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	2.34E-10	=	[	1.9E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.86E-08	=	[	2.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.73E-08	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.07E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	2.82E-09	=	[	2.3E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.44E-05	=	[	3.6E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.29E-08	=	[	1.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.94E-07	=	[	5.6E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	3.40E-09	=	[	2.7E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	2.23E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	5.52E-08	=	[	4.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	2.21E-09	=	[	1.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	1.67E-09	=	[	1.3E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.11E-10	=	[	9.0E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	5.68E-08	=	[	4.6E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	9.28E-10	=	[	7.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.13E-07	=	[	9.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	7.62E-08	=	[	6.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	3.40E-10	=	[	2.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Di-n-butylphthalate	9.70E-10	=	[	7.8E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	6.70E-13	=	[	5.4E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.05E-12	=	[	8.5E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.45E-08	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	8.62E-11	=	[	1.37E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.25E-08	=	[	2.00E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Di-n-butylphthalate	3.58E-08	=	[	5.70E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.65E-07	=	[	5.02E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	2.41E-10	=	[	1.37E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	3.51E-08	=	[	2.00E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Di-n-butylphthalate	1.00E-07	=	[	5.70E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.33E-03	x	0.00E+00	=	0.00E+00	3.73E-03	/	1.00E+00	=	3.73E-03
Antimony	4.86E-08	x	0.00E+00	=	0.00E+00	1.36E-07	/	4.00E-04	=	3.40E-04
Arsenic	9.54E-07	x	1.50E+00	=	1.43E-06	2.67E-06	/	3.00E-04	=	8.91E-03
Barium	1.72E-05	x	0.00E+00	=	0.00E+00	4.82E-05	/	2.00E-01	=	2.41E-04
Beryllium	3.78E-08	x	0.00E+00	=	0.00E+00	1.06E-07	/	2.00E-03	=	5.29E-05
Cadmium	2.61E-08	x	0.00E+00	=	0.00E+00	7.32E-08	/	1.00E-03	=	7.32E-05
Chromium	3.19E-06	x	0.00E+00	=	0.00E+00	8.94E-06	/	3.00E-03	=	2.98E-03
Cobalt	1.94E-06	x	0.00E+00	=	0.00E+00	5.42E-06	/	3.00E-04	=	1.81E-02
Copper	2.32E-06	x	0.00E+00	=	0.00E+00	6.49E-06	/	4.00E-02	=	1.62E-04
Fluoride	3.15E-07	x	0.00E+00	=	0.00E+00	8.82E-07	/	4.00E-02	=	2.20E-05
Iron	4.96E-03	x	0.00E+00	=	0.00E+00	1.39E-02	/	7.00E-01	=	1.98E-02
Lithium	1.44E-06	x	0.00E+00	=	0.00E+00	4.03E-06	/	2.00E-03	=	2.01E-03
Manganese	7.76E-05	x	0.00E+00	=	0.00E+00	2.17E-04	/	1.40E-01	=	1.55E-03
Molybdenum	3.80E-07	x	0.00E+00	=	0.00E+00	1.06E-06	/	5.00E-03	=	2.13E-04
Nickel	2.49E-06	x	0.00E+00	=	0.00E+00	6.96E-06	/	2.00E-02	=	3.48E-04
Nitrate	6.17E-06	x	0.00E+00	=	0.00E+00	1.73E-05	/	1.60E+00	=	1.08E-05
Nitrite	2.47E-07	x	0.00E+00	=	0.00E+00	6.92E-07	/	1.00E-01	=	6.92E-06
Selenium	1.87E-07	x	0.00E+00	=	0.00E+00	5.23E-07	/	5.00E-03	=	1.05E-04
Silver	1.24E-08	x	0.00E+00	=	0.00E+00	3.49E-08	/	5.00E-03	=	6.97E-06
Strontium	6.35E-06	x	0.00E+00	=	0.00E+00	1.78E-05	/	6.00E-01	=	2.96E-05
Total Uranium	1.04E-07	x	0.00E+00	=	0.00E+00	2.90E-07	/	3.00E-03	=	9.68E-05
Vanadium	1.26E-05	x	0.00E+00	=	0.00E+00	3.52E-05	/	5.00E-03	=	7.04E-03
Zinc	8.51E-06	x	0.00E+00	=	0.00E+00	2.38E-05	/	3.00E-01	=	7.95E-05
Butylbenzylphthalate	3.80E-08	x	1.90E-03	=	7.22E-11	1.06E-07	/	2.00E-01	=	5.32E-07
Di-n-butylphthalate	1.08E-07	x	0.00E+00	=	0.00E+00	3.03E-07	/	1.00E-01	=	3.03E-06
Styrene	7.49E-11	x	0.00E+00	=	0.00E+00	2.10E-10	/	2.00E-01	=	1.05E-09
Toluene	1.18E-10	x	0.00E+00	=	0.00E+00	3.29E-10	/	8.00E-02	=	4.11E-09
			Pathway total	=	1.43E-06			Pathway total	=	6.59E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	Unit Risk	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	4.26E-06	x		=	NA	1.19E-05	/[	5.00E-03	x	1000	]=	2.38E-06
Antimony	1.55E-10	x		=	NA	4.35E-10	/[		x	1000	]=	NA
Arsenic	3.05E-09	x	4.30E-03	=	1.31E-11	8.54E-09	/[	1.50E-05	x	1000	]=	5.69E-07
Barium	5.50E-08	x		=	NA	1.54E-07	/[	5.00E-04	x	1000	]=	3.08E-07
Beryllium	1.21E-10	x	2.40E-03	=	2.90E-13	3.38E-10	/[	2.00E-05	x	1001	]=	1.69E-08
Cadmium	8.35E-11	x	1.80E-03	=	1.50E-13	2.34E-10	/[	1.00E-05	x	1002	]=	2.33E-08
Chromium	1.02E-08	x	8.40E-02	=	8.57E-10	2.86E-08	/[	1.00E-04	x	1003	]=	2.85E-07
Cobalt	6.19E-09	x	9.00E-03	=	5.57E-11	1.73E-08	/[	6.00E-06	x	1004	]=	2.88E-06
Copper	7.41E-09	x		=	NA	2.07E-08	/[		x	1005	]=	NA
Fluoride	1.01E-09	x		=	NA	2.82E-09	/[	1.30E-02	x	1000	]=	2.17E-10
Iron	1.59E-05	x		=	NA	4.44E-05	/[		x	1000	]=	NA
Lithium	4.60E-09	x		=	NA	1.29E-08	/[		x	1000	]=	NA
Manganese	2.48E-07	x		=	NA	6.94E-07	/[	5.00E-05	x	1000	]=	1.39E-05
Molybdenum	1.22E-09	x	0.00E+00	=	0.00E+00	3.40E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	7.95E-09	x	2.60E-04	=	2.07E-12	2.23E-08	/[	9.00E-05	x	1000	]=	2.47E-07
Nitrate	1.97E-08	x		=	NA	5.52E-08	/[		x	1000	]=	NA
Nitrite	7.90E-10	x		=	NA	2.21E-09	/[		x	1000	]=	NA
Selenium	5.97E-10	x	0.00E+00	=	0.00E+00	1.67E-09	/[	2.00E-02	x	1000	]=	8.36E-11
Silver	3.98E-11	x		=	NA	1.11E-10	/[		x	1000	]=	NA
Strontium	2.03E-08	x		=	NA	5.68E-08	/[		x	1000	]=	NA
Total Uranium	3.31E-10	x		=	NA	9.28E-10	/[	4.00E-05	x	1000	]=	2.32E-08
Vanadium	4.02E-08	x		=	NA	1.13E-07	/[	1.00E-04	x	1000	]=	1.13E-06
Zinc	2.72E-08	x		=	NA	7.62E-08	/[		x	1000	]=	NA
Butylbenzylphthalate	1.22E-10	x	0.00E+00	=	0.00E+00	3.40E-10	/[		x	1000	]=	NA
Di-n-butylphthalate	3.46E-10	x	0.00E+00	=	0.00E+00	9.70E-10	/[	0.00E+00	x	1000	]=	NA
Styrene	2.39E-13	x	0.00E+00	=	0.00E+00	6.70E-13	/[	1.00E+00	x	1000	]=	6.70E-16
Toluene	3.76E-13	x	0.00E+00	=	0.00E+00	1.05E-12	/[	5.00E+00	x	1000	]=	2.10E-16
			Pathway total =		9.29E-10					Pathway total =		2.17E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.45E-08	x	1.50E+00	=	1.42E-07	2.65E-07	/	3.00E-04	=	8.82E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	8.62E-11	x		=	NA	2.41E-10	/	2.50E-05	=	9.66E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.25E-08	x	1.90E-03	=	2.38E-11	3.51E-08	/	2.00E-01	=	1.76E-07
Di-n-butylphthalate	3.58E-08	x		=	NA	1.00E-07	/	1.00E-01	=	1.00E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.42E-07			Pathway total =		8.93E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-04
Arsenic	Sum of all pathways	=	1.57E-06	Sum of all pathways	=	9.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Beryllium	Sum of all pathways	=	2.90E-13	Sum of all pathways	=	5.3E-05
Cadmium	Sum of all pathways	=	1.50E-13	Sum of all pathways	=	8.3E-05
Chromium	Sum of all pathways	=	8.57E-10	Sum of all pathways	=	3.0E-03
Cobalt	Sum of all pathways	=	5.57E-11	Sum of all pathways	=	1.8E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Nickel	Sum of all pathways	=	2.07E-12	Sum of all pathways	=	3.5E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-05
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.7E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-05
Butylbenzylphthalate	Sum of all pathways	=	9.61E-11	Sum of all pathways	=	7.1E-07
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-06
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-09

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.57E-06	All Pathways and Chemicals	=	6.68E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.47E-03	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	4.11E-07	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.50E-06	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	4.64E-05	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	6.24E-08	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Boron	8.35E-06	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.15E-08	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	2.21E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.57E-06	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.62E-06	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	2.91E-07	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.58E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.65E-06	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	7.28E-05	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	3.08E-09	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.60E-06	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	1.75E-06	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	4.75E-07	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.19E-08	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	2.38E-05	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Tin	6.84E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.24E-07	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.03E-05	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	9.94E-06	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.94E-07	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.48E-08	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.12E-03	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.15E-06	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	4.20E-06	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	1.30E-04	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	1.75E-07	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Boron	2.34E-05	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	6.01E-08	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	6.17E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.40E-06	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	7.35E-06	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	8.14E-07	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.28E-02	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.62E-06	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.04E-04	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	8.62E-09	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	7.29E-06	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	4.91E-06	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	1.33E-06	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	3.32E-08	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	6.65E-05	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Tin	1.92E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.46E-07	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	2.89E-05	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.78E-05	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	1.10E-06	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	4.14E-08	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.70E-06	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.31E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	4.79E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	1.48E-07	=	[	3.3E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.99E-10	=	[	4.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	2.67E-08	=	[	6.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	6.87E-11	=	[	1.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	7.05E-09	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.03E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	8.39E-09	=	[	1.9E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	9.30E-10	=	[	2.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.46E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.27E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.33E-07	=	[	5.2E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	9.84E-12	=	[	2.2E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	8.32E-09	=	[	1.9E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	5.61E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.52E-09	=	[	3.4E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	3.79E-11	=	[	8.5E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	7.60E-08	=	[	1.7E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	2.19E-09	=	[	4.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	3.95E-10	=	[	8.9E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.30E-08	=	[	7.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	3.18E-08	=	[	7.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.26E-09	=	[	2.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.73E-11	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.32E-05	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	3.67E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.34E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	4.15E-07	=	[	3.3E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	5.58E-10	=	[	4.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	7.47E-08	=	[	6.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.92E-10	=	[	1.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.97E-08	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.41E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.35E-08	=	[	1.9E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	2.60E-09	=	[	2.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.10E-05	=	[	3.3E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.48E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.52E-07	=	[	5.2E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	2.76E-11	=	[	2.2E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	2.33E-08	=	[	1.9E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.57E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	4.25E-09	=	[	3.4E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.06E-10	=	[	8.5E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	2.13E-07	=	[	1.7E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	6.12E-09	=	[	4.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.11E-09	=	[	8.9E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	9.24E-08	=	[	7.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	8.90E-08	=	[	7.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	3.52E-09	=	[	2.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.32E-10	=	[	1.1E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.48E-07	=	[	7.89E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	7.09E-11	=	[	1.13E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.30E-07	=	[	2.07E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.88E-09	=	[	7.78E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	4.16E-07	=	[	7.89E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	1.98E-10	=	[	1.13E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	3.64E-07	=	[	2.07E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.37E-08	=	[	7.78E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.47E-03	x	0.00E+00	=	0.00E+00	4.12E-03	/	1.00E+00	=	4.12E-03
Antimony	4.11E-07	x	0.00E+00	=	0.00E+00	1.15E-06	/	4.00E-04	=	2.87E-03
Arsenic	1.50E-06	x	1.50E+00	=	2.25E-06	4.20E-06	/	3.00E-04	=	1.40E-02
Barium	4.64E-05	x	0.00E+00	=	0.00E+00	1.30E-04	/	2.00E-01	=	6.49E-04
Beryllium	6.24E-08	x	0.00E+00	=	0.00E+00	1.75E-07	/	2.00E-03	=	8.73E-05
Boron	8.35E-06	x	0.00E+00	=	0.00E+00	2.34E-05	/	2.00E-01	=	1.17E-04
Cadmium	2.15E-08	x	0.00E+00	=	0.00E+00	6.01E-08	/	1.00E-03	=	6.01E-05
Chromium	2.21E-06	x	0.00E+00	=	0.00E+00	6.17E-06	/	3.00E-03	=	2.06E-03
Cobalt	1.57E-06	x	0.00E+00	=	0.00E+00	4.40E-06	/	3.00E-04	=	1.47E-02
Copper	2.62E-06	x	0.00E+00	=	0.00E+00	7.35E-06	/	4.00E-02	=	1.84E-04
Fluoride	2.91E-07	x	0.00E+00	=	0.00E+00	8.14E-07	/	4.00E-02	=	2.04E-05
Iron	4.58E-03	x	0.00E+00	=	0.00E+00	1.28E-02	/	7.00E-01	=	1.83E-02
Lithium	1.65E-06	x	0.00E+00	=	0.00E+00	4.62E-06	/	2.00E-03	=	2.31E-03
Manganese	7.28E-05	x	0.00E+00	=	0.00E+00	2.04E-04	/	1.40E-01	=	1.46E-03
Mercury	3.08E-09	x	0.00E+00	=	0.00E+00	8.62E-09	/	0.00E+00	=	NA
Nickel	2.60E-06	x	0.00E+00	=	0.00E+00	7.29E-06	/	2.00E-02	=	3.65E-04
Nitrate	1.75E-06	x	0.00E+00	=	0.00E+00	4.91E-06	/	1.60E+00	=	3.07E-06
Nitrite	4.75E-07	x	0.00E+00	=	0.00E+00	1.33E-06	/	1.00E-01	=	1.33E-05
Silver	1.19E-08	x	0.00E+00	=	0.00E+00	3.32E-08	/	5.00E-03	=	6.64E-06
Strontium	2.38E-05	x	0.00E+00	=	0.00E+00	6.65E-05	/	6.00E-01	=	1.11E-04
Tin	6.84E-07	x	0.00E+00	=	0.00E+00	1.92E-06	/	6.00E-01	=	3.19E-06
Total Uranium	1.24E-07	x	0.00E+00	=	0.00E+00	3.46E-07	/	3.00E-03	=	1.15E-04
Vanadium	1.03E-05	x	0.00E+00	=	0.00E+00	2.89E-05	/	5.00E-03	=	5.78E-03
Zinc	9.94E-06	x	0.00E+00	=	0.00E+00	2.78E-05	/	3.00E-01	=	9.28E-05
Bis(2-ethylhexyl) phthalate	3.94E-07	x	1.40E-02	=	5.51E-09	1.10E-06	/	2.00E-02	=	5.51E-05
Butylbenzylphthalate	1.48E-08	x	1.90E-03	=	2.81E-11	4.14E-08	/	2.00E-01	=	2.07E-07
			Pathway total	=	2.26E-06			Pathway total	=	6.75E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.70E-06	x		=	NA	1.32E-05	/[	5.00E-03	x	1000	]=	2.63E-06
Antimony	1.31E-09	x		=	NA	3.67E-09	/[		x	1000	]=	NA
Arsenic	4.79E-09	x	4.30E-03	=	2.06E-11	1.34E-08	/[	1.50E-05	x	1000	]=	8.95E-07
Barium	1.48E-07	x		=	NA	4.15E-07	/[	5.00E-04	x	1000	]=	8.30E-07
Beryllium	1.99E-10	x	2.40E-03	=	4.78E-13	5.58E-10	/[	2.00E-05	x	1000	]=	2.79E-08
Boron	2.67E-08	x	0.00E+00	=	0.00E+00	7.47E-08	/[	2.00E-02	x	1000	]=	3.73E-09
Cadmium	6.87E-11	x	1.80E-03	=	1.24E-13	1.92E-10	/[	1.00E-05	x	1000	]=	1.92E-08
Chromium	7.05E-09	x	8.40E-02	=	5.92E-10	1.97E-08	/[	1.00E-04	x	1000	]=	1.97E-07
Cobalt	5.03E-09	x	9.00E-03	=	4.52E-11	1.41E-08	/[	6.00E-06	x	1000	]=	2.35E-06
Copper	8.39E-09	x		=	NA	2.35E-08	/[		x	1000	]=	NA
Fluoride	9.30E-10	x		=	NA	2.60E-09	/[	1.30E-02	x	1000	]=	2.00E-10
Iron	1.46E-05	x		=	NA	4.10E-05	/[		x	1000	]=	NA
Lithium	5.27E-09	x		=	NA	1.48E-08	/[		x	1000	]=	NA
Manganese	2.33E-07	x		=	NA	6.52E-07	/[	5.00E-05	x	1000	]=	1.30E-05
Mercury	9.84E-12	x	0.00E+00	=	0.00E+00	2.76E-11	/[	3.00E-04	x	1000	]=	9.19E-11
Nickel	8.32E-09	x	2.60E-04	=	2.16E-12	2.33E-08	/[	9.00E-05	x	1000	]=	2.59E-07
Nitrate	5.61E-09	x		=	NA	1.57E-08	/[		x	1000	]=	NA
Nitrite	1.52E-09	x		=	NA	4.25E-09	/[		x	1000	]=	NA
Silver	3.79E-11	x		=	NA	1.06E-10	/[		x	1000	]=	NA
Strontium	7.60E-08	x		=	NA	2.13E-07	/[		x	1000	]=	NA
Tin	2.19E-09	x		=	NA	6.12E-09	/[		x	1000	]=	NA
Total Uranium	3.95E-10	x		=	NA	1.11E-09	/[	4.00E-05	x	1000	]=	2.77E-08
Vanadium	3.30E-08	x		=	NA	9.24E-08	/[	1.00E-04	x	1000	]=	9.24E-07
Zinc	3.18E-08	x		=	NA	8.90E-08	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.26E-09	x	2.40E-06	=	3.02E-15	3.52E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	4.73E-11	x	0.00E+00	=	0.00E+00	1.32E-10	/[		x	1000	]=	NA
			Pathway total =		6.61E-10					Pathway total =		2.12E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.48E-07	x	1.50E+00	=	2.23E-07	4.16E-07	/	3.00E-04	=	1.39E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	7.09E-11	x		=	NA	1.98E-10	/	2.50E-05	=	7.94E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	1.30E-07	x	1.40E-02	=	1.82E-09	3.64E-07	/	2.00E-02	=	1.82E-05
Butylbenzylphthalate	4.88E-09	x	1.90E-03	=	9.27E-12	1.37E-08	/	2.00E-01	=	6.83E-08
			Pathway total =		2.25E-07			Pathway total =		1.41E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-03
Arsenic	Sum of all pathways	=	2.47E-06	Sum of all pathways	=	1.5E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-04
Beryllium	Sum of all pathways	=	4.78E-13	Sum of all pathways	=	8.7E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Cadmium	Sum of all pathways	=	1.24E-13	Sum of all pathways	=	6.8E-05
Chromium	Sum of all pathways	=	5.92E-10	Sum of all pathways	=	2.1E-03
Cobalt	Sum of all pathways	=	4.52E-11	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.2E-11
Nickel	Sum of all pathways	=	2.16E-12	Sum of all pathways	=	3.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.33E-09	Sum of all pathways	=	7.3E-05
Butylbenzylphthalate	Sum of all pathways	=	3.74E-11	Sum of all pathways	=	2.8E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	2.48E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	6.89E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.22E-03	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	5.12E-08	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	6.84E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.59E-05	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	3.12E-08	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	1.82E-08	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	1.84E-06	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.57E-06	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.31E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	2.40E-07	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.00E-03	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.34E-06	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	6.77E-05	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	3.25E-09	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	4.66E-07	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.50E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	1.46E-06	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	5.89E-07	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	2.57E-07	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.79E-08	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	5.89E-06	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.31E-07	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.12E-05	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	7.23E-06	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	8.78E-09	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
1-Butanol	4.22E-09	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.50E-07	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.13E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Hexane	1.15E-08	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	4.31E-09	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.41E-03	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.43E-07	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.92E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.44E-05	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	8.72E-08	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	5.09E-08	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	5.15E-06	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.40E-06	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	6.48E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	6.73E-07	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.12E-02	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	3.76E-06	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	1.89E-04	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	9.10E-09	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	1.30E-06	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	6.99E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	4.09E-06	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	1.65E-06	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	7.19E-07	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	5.00E-08	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.65E-05	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.66E-07	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.15E-05	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.02E-05	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	2.46E-08	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
1-Butanol	1.18E-08	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	9.79E-07	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	3.15E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Hexane	3.22E-08	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	1.21E-08	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	3.89E-06	=	[	8.8E-05	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.64E-10	=	[	3.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	2.19E-09	=	[	4.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	5.07E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	9.96E-11	=	[	2.2E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	5.81E-11	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	5.88E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.02E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	7.40E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	7.68E-10	=	[	1.7E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.28E-05	=	[	2.9E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	4.30E-09	=	[	9.7E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.16E-07	=	[	4.9E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.04E-11	=	[	2.3E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	1.49E-09	=	[	3.4E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	7.98E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	4.67E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.88E-09	=	[	4.2E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	8.20E-10	=	[	1.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	5.71E-11	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	1.88E-08	=	[	4.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	4.18E-10	=	[	9.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.59E-08	=	[	8.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.31E-08	=	[	5.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	2.81E-11	=	[	6.3E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
1-Butanol	1.35E-11	=	[	3.0E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.12E-09	=	[	2.5E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	3.60E-11	=	[	8.1E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Hexane	3.68E-11	=	[	8.3E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	1.38E-11	=	[	3.1E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.09E-05	=	[	8.8E-05	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.58E-10	=	[	3.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	6.12E-09	=	[	4.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.42E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	2.79E-10	=	[	2.2E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	1.63E-10	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.65E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.41E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.07E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	2.15E-09	=	[	1.7E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	3.58E-05	=	[	2.9E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.20E-08	=	[	9.7E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.05E-07	=	[	4.9E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	2.91E-11	=	[	2.3E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	4.17E-09	=	[	3.4E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	2.23E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.31E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	5.27E-09	=	[	4.2E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	2.30E-09	=	[	1.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.60E-10	=	[	1.3E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	5.28E-08	=	[	4.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.17E-09	=	[	9.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.01E-07	=	[	8.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	6.47E-08	=	[	5.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	7.86E-11	=	[	6.3E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
1-Butanol	3.78E-11	=	[	3.0E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	3.13E-09	=	[	2.5E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.01E-10	=	[	8.1E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Hexane	1.03E-10	=	[	8.3E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	3.85E-11	=	[	3.1E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	6.77E-08	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	6.00E-11	=	[	9.56E-02	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
1-Butanol	1.39E-09	=	[	2.22E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.15E-07	=	[	1.84E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.71E-09	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	1.42E-09	=	[	2.27E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	1.90E-07	=	[	3.60E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	1.68E-10	=	[	9.56E-02	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
1-Butanol	3.90E-09	=	[	2.22E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	3.23E-07	=	[	1.84E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.04E-08	=	[	5.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	3.98E-09	=	[	2.27E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.22E-03	x	0.00E+00	=	0.00E+00	3.41E-03	/	1.00E+00	=	3.41E-03
Antimony	5.12E-08	x	0.00E+00	=	0.00E+00	1.43E-07	/	4.00E-04	=	3.58E-04
Arsenic	6.84E-07	x	1.50E+00	=	1.03E-06	1.92E-06	/	3.00E-04	=	6.39E-03
Barium	1.59E-05	x	0.00E+00	=	0.00E+00	4.44E-05	/	2.00E-01	=	2.22E-04
Beryllium	3.12E-08	x	0.00E+00	=	0.00E+00	8.72E-08	/	2.00E-03	=	4.36E-05
Cadmium	1.82E-08	x	0.00E+00	=	0.00E+00	5.09E-08	/	1.00E-03	=	5.09E-05
Chromium	1.84E-06	x	0.00E+00	=	0.00E+00	5.15E-06	/	3.00E-03	=	1.72E-03
Cobalt	1.57E-06	x	0.00E+00	=	0.00E+00	4.40E-06	/	3.00E-04	=	1.47E-02
Copper	2.31E-06	x	0.00E+00	=	0.00E+00	6.48E-06	/	4.00E-02	=	1.62E-04
Fluoride	2.40E-07	x	0.00E+00	=	0.00E+00	6.73E-07	/	4.00E-02	=	1.68E-05
Iron	4.00E-03	x	0.00E+00	=	0.00E+00	1.12E-02	/	7.00E-01	=	1.60E-02
Lithium	1.34E-06	x	0.00E+00	=	0.00E+00	3.76E-06	/	2.00E-03	=	1.88E-03
Manganese	6.77E-05	x	0.00E+00	=	0.00E+00	1.89E-04	/	1.40E-01	=	1.35E-03
Mercury	3.25E-09	x	0.00E+00	=	0.00E+00	9.10E-09	/	0.00E+00	=	NA
Molybdenum	4.66E-07	x	0.00E+00	=	0.00E+00	1.30E-06	/	5.00E-03	=	2.61E-04
Nickel	2.50E-06	x	0.00E+00	=	0.00E+00	6.99E-06	/	2.00E-02	=	3.49E-04
Nitrate	1.46E-06	x	0.00E+00	=	0.00E+00	4.09E-06	/	1.60E+00	=	2.56E-06
Nitrite	5.89E-07	x	0.00E+00	=	0.00E+00	1.65E-06	/	1.00E-01	=	1.65E-05
Selenium	2.57E-07	x	0.00E+00	=	0.00E+00	7.19E-07	/	5.00E-03	=	1.44E-04
Silver	1.79E-08	x	0.00E+00	=	0.00E+00	5.00E-08	/	5.00E-03	=	1.00E-05
Strontium	5.89E-06	x	0.00E+00	=	0.00E+00	1.65E-05	/	6.00E-01	=	2.75E-05
Total Uranium	1.31E-07	x	0.00E+00	=	0.00E+00	3.66E-07	/	3.00E-03	=	1.22E-04
Vanadium	1.12E-05	x	0.00E+00	=	0.00E+00	3.15E-05	/	5.00E-03	=	6.29E-03
Zinc	7.23E-06	x	0.00E+00	=	0.00E+00	2.02E-05	/	3.00E-01	=	6.74E-05
Acetone	8.78E-09	x	0.00E+00	=	0.00E+00	2.46E-08	/	9.00E-01	=	2.73E-08
1-Butanol	4.22E-09	x	0.00E+00	=	0.00E+00	1.18E-08	/	1.00E-01	=	1.18E-07
Bis(2-ethylhexyl) phthalate	3.50E-07	x	1.40E-02	=	4.90E-09	9.79E-07	/	2.00E-02	=	4.90E-05
Butylbenzylphthalate	1.13E-08	x	1.90E-03	=	2.14E-11	3.15E-08	/	2.00E-01	=	1.58E-07
Hexane	1.15E-08	x	0.00E+00	=	0.00E+00	3.22E-08	/	6.00E-02	=	5.37E-07
beta-BHC	4.31E-09	x	1.80E+00	=	7.75E-09	1.21E-08	/	0.00E+00	=	NA
			Pathway total	=	1.04E-06			Pathway total	=	5.36E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	3.89E-06	x		=	NA	1.09E-05	/[	5.00E-03	x	1000	]=	2.18E-06
Antimony	1.64E-10	x		=	NA	4.58E-10	/[		x	1000	]=	NA
Arsenic	2.19E-09	x	4.30E-03	=	9.40E-12	6.12E-09	/[	1.50E-05	x	1000	]=	4.08E-07
Barium	5.07E-08	x		=	NA	1.42E-07	/[	5.00E-04	x	1000	]=	2.84E-07
Beryllium	9.96E-11	x	2.40E-03	=	2.39E-13	2.79E-10	/[	2.00E-05	x	1000	]=	1.39E-08
Cadmium	5.81E-11	x	1.80E-03	=	1.05E-13	1.63E-10	/[	1.00E-05	x	1000	]=	1.63E-08
Chromium	5.88E-09	x	8.40E-02	=	4.94E-10	1.65E-08	/[	1.00E-04	x	1000	]=	1.65E-07
Cobalt	5.02E-09	x	9.00E-03	=	4.52E-11	1.41E-08	/[	6.00E-06	x	1000	]=	2.34E-06
Copper	7.40E-09	x		=	NA	2.07E-08	/[		x	1000	]=	NA
Fluoride	7.68E-10	x		=	NA	2.15E-09	/[	1.30E-02	x	1000	]=	1.65E-10
Iron	1.28E-05	x		=	NA	3.58E-05	/[		x	1000	]=	NA
Lithium	4.30E-09	x		=	NA	1.20E-08	/[		x	1000	]=	NA
Manganese	2.16E-07	x		=	NA	6.05E-07	/[	5.00E-05	x	1000	]=	1.21E-05
Mercury	1.04E-11	x	0.00E+00	=	0.00E+00	2.91E-11	/[	3.00E-04	x	1000	]=	9.70E-11
Molybdenum	1.49E-09	x	0.00E+00	=	0.00E+00	4.17E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	7.98E-09	x	2.60E-04	=	2.07E-12	2.23E-08	/[	9.00E-05	x	1000	]=	2.48E-07
Nitrate	4.67E-09	x		=	NA	1.31E-08	/[		x	1000	]=	NA
Nitrite	1.88E-09	x		=	NA	5.27E-09	/[		x	1000	]=	NA
Selenium	8.20E-10	x	0.00E+00	=	0.00E+00	2.30E-09	/[	2.00E-02	x	1000	]=	1.15E-10
Silver	5.71E-11	x		=	NA	1.60E-10	/[		x	1000	]=	NA
Strontium	1.88E-08	x		=	NA	5.28E-08	/[		x	1000	]=	NA
Total Uranium	4.18E-10	x		=	NA	1.17E-09	/[	4.00E-05	x	1000	]=	2.92E-08
Vanadium	3.59E-08	x		=	NA	1.01E-07	/[	1.00E-04	x	1000	]=	1.01E-06
Zinc	2.31E-08	x		=	NA	6.47E-08	/[		x	1000	]=	NA
Acetone	2.81E-11	x	0.00E+00	=	0.00E+00	7.86E-11	/[	3.10E+01	x	1000	]=	2.54E-15
1-Butanol	1.35E-11	x	0.00E+00	=	0.00E+00	3.78E-11	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.12E-09	x	2.40E-06	=	2.68E-15	3.13E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	3.60E-11	x	0.00E+00	=	0.00E+00	1.01E-10	/[		x	1000	]=	NA
Hexane	3.68E-11	x	0.00E+00	=	0.00E+00	1.03E-10	/[	7.00E-01	x	1000	]=	1.47E-13
beta-BHC	1.38E-11	x	5.30E-04	=	7.29E-15	3.85E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		5.51E-10					Pathway total =		1.88E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.77E-08	x	1.50E+00	=	1.02E-07	1.90E-07	/	3.00E-04	=	6.32E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	6.00E-11	x		=	NA	1.68E-10	/	2.50E-05	=	6.72E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	1.39E-09	x		=	NA	3.90E-09	/	1.00E-01	=	3.90E-08
Bis(2-ethylhexyl) phthalate	1.15E-07	x	1.40E-02	=	1.62E-09	3.23E-07	/	2.00E-02	=	1.62E-05
Butylbenzylphthalate	3.71E-09	x	1.90E-03	=	7.06E-12	1.04E-08	/	2.00E-01	=	5.20E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	1.42E-09	x	1.80E+00	=	2.56E-09	3.98E-09	/		=	NA
			Pathway total =		1.06E-07			Pathway total =		6.55E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-04
Arsenic	Sum of all pathways	=	1.13E-06	Sum of all pathways	=	7.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Beryllium	Sum of all pathways	=	2.39E-13	Sum of all pathways	=	4.4E-05
Cadmium	Sum of all pathways	=	1.05E-13	Sum of all pathways	=	5.8E-05
Chromium	Sum of all pathways	=	4.94E-10	Sum of all pathways	=	1.7E-03
Cobalt	Sum of all pathways	=	4.52E-11	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.7E-11
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Nickel	Sum of all pathways	=	2.07E-12	Sum of all pathways	=	3.5E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-08
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	6.51E-09	Sum of all pathways	=	6.5E-05
Butylbenzylphthalate	Sum of all pathways	=	2.84E-11	Sum of all pathways	=	2.1E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-07
beta-BHC	Sum of all pathways	=	1.03E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.15E-06	All Pathways and Chemicals	=	5.43E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.36E-03	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	4.47E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.63E-07	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.55E-05	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	5.25E-08	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.30E-08	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	2.36E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.74E-06	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.43E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	5.46E-07	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.81E-03	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.59E-06	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	6.93E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	3.65E-09	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.11E-06	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	2.17E-06	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	8.76E-07	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	3.37E-08	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	6.30E-06	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Tin	2.74E-06	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	2.98E-07	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.48E-05	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	3.49E-05	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	1.86E-09	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.37E-07	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.64E-07	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	2.55E-10	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	5.59E-11	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	4.90E-09	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1260	5.09E-09	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.79E-03	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.25E-07	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.70E-06	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.34E-05	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	1.47E-07	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	6.43E-08	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	6.60E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.87E-06	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	6.80E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.53E-06	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.35E-02	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.45E-06	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	1.94E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	1.02E-08	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	5.91E-06	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	6.09E-06	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	2.45E-06	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	9.44E-08	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.76E-05	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Tin	7.66E-06	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	8.35E-07	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	4.14E-05	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	9.76E-05	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	5.22E-09	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	1.22E-06	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Di-n-butylphthalate	4.59E-07	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	7.13E-10	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	1.56E-10	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	1.37E-08	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1260	1.43E-08	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.33E-06	=	[	9.8E-05	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.43E-10	=	[	3.2E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	3.08E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	4.95E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.68E-10	=	[	3.8E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	7.34E-11	=	[	1.7E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	7.54E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.56E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	7.76E-09	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.75E-09	=	[	3.9E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.54E-05	=	[	3.5E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.08E-09	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.21E-07	=	[	5.0E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.17E-11	=	[	2.6E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	6.75E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	6.95E-09	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	2.80E-09	=	[	6.3E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	1.08E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.01E-08	=	[	4.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Tin	8.75E-09	=	[	2.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	9.53E-10	=	[	2.1E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	4.72E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	1.11E-07	=	[	2.5E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	5.96E-12	=	[	1.3E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.40E-09	=	[	3.2E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	5.24E-10	=	[	1.2E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	8.14E-13	=	[	1.8E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	1.79E-13	=	[	4.0E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
beta-BHC	1.57E-11	=	[	3.5E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Aroclor-1260	1.63E-11	=	[	3.7E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	**EC**	**=**	**[**	**CA**	**x**	**EF**	**x**	**ET**	**x**	**ED**	**]**	**/**	**[(**	**AT**	**x**	**CF2**	**)]**
Units	**ug/m^3**			**ug/m^3**		**days/year**		**hrs/day**		**years**				**days**		**hrs/day**	

NONCARCINOGENIC EFFECTS

Aluminum	1.21E-05	=	[	9.8E-05	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.00E-10	=	[	3.2E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	8.62E-09	=	[	6.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.39E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	4.70E-10	=	[	3.8E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	2.05E-10	=	[	1.7E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	2.11E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.56E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.17E-08	=	[	1.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	4.89E-09	=	[	3.9E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.31E-05	=	[	3.5E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.42E-08	=	[	1.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.20E-07	=	[	5.0E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	3.27E-11	=	[	2.6E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	1.89E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.95E-08	=	[	1.6E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	7.84E-09	=	[	6.3E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	3.02E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	5.64E-08	=	[	4.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Tin	2.45E-08	=	[	2.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	2.67E-09	=	[	2.1E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.32E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	3.12E-07	=	[	2.5E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.67E-11	=	[	1.3E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Bis(2-ethylhexyl) phthalate	3.91E-09	=	[	3.2E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Di-n-butylphthalate	1.47E-09	=	[	1.2E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	2.28E-12	=	[	1.8E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	5.00E-13	=	[	4.0E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
beta-BHC	4.39E-11	=	[	3.5E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Aroclor-1260	4.56E-11	=	[	3.7E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	9.53E-08	=	[	5.06E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	7.58E-11	=	[	1.21E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.44E-07	=	[	2.30E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Di-n-butylphthalate	5.41E-08	=	[	8.63E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
beta-BHC	1.62E-09	=	[	2.58E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Aroclor-1260	2.35E-09	=	[	2.68E-02	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	2.67E-07	=	[	5.06E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	2.12E-10	=	[	1.21E-01	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Bis(2-ethylhexyl) phthalate	4.04E-07	=	[	2.30E+00	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Di-n-butylphthalate	1.52E-07	=	[	8.63E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
beta-BHC	4.53E-09	=	[	2.58E-02	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Aroclor-1260	6.59E-09	=	[	2.68E-02	x	1.00E-06	x	3,300	x	0.1	x	0.14	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.36E-03	x	0.00E+00	=	0.00E+00	3.79E-03	/	1.00E+00	=	3.79E-03
Antimony	4.47E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	4.00E-04	=	3.13E-04
Arsenic	9.63E-07	x	1.50E+00	=	1.44E-06	2.70E-06	/	3.00E-04	=	8.98E-03
Barium	1.55E-05	x	0.00E+00	=	0.00E+00	4.34E-05	/	2.00E-01	=	2.17E-04
Beryllium	5.25E-08	x	0.00E+00	=	0.00E+00	1.47E-07	/	2.00E-03	=	7.35E-05
Cadmium	2.30E-08	x	0.00E+00	=	0.00E+00	6.43E-08	/	1.00E-03	=	6.43E-05
Chromium	2.36E-06	x	0.00E+00	=	0.00E+00	6.60E-06	/	3.00E-03	=	2.20E-03
Cobalt	1.74E-06	x	0.00E+00	=	0.00E+00	4.87E-06	/	3.00E-04	=	1.62E-02
Copper	2.43E-06	x	0.00E+00	=	0.00E+00	6.80E-06	/	4.00E-02	=	1.70E-04
Fluoride	5.46E-07	x	0.00E+00	=	0.00E+00	1.53E-06	/	4.00E-02	=	3.82E-05
Iron	4.81E-03	x	0.00E+00	=	0.00E+00	1.35E-02	/	7.00E-01	=	1.92E-02
Lithium	1.59E-06	x	0.00E+00	=	0.00E+00	4.45E-06	/	2.00E-03	=	2.23E-03
Manganese	6.93E-05	x	0.00E+00	=	0.00E+00	1.94E-04	/	1.40E-01	=	1.39E-03
Mercury	3.65E-09	x	0.00E+00	=	0.00E+00	1.02E-08	/	0.00E+00	=	NA
Nickel	2.11E-06	x	0.00E+00	=	0.00E+00	5.91E-06	/	2.00E-02	=	2.96E-04
Nitrate	2.17E-06	x	0.00E+00	=	0.00E+00	6.09E-06	/	1.60E+00	=	3.80E-06
Nitrite	8.76E-07	x	0.00E+00	=	0.00E+00	2.45E-06	/	1.00E-01	=	2.45E-05
Silver	3.37E-08	x	0.00E+00	=	0.00E+00	9.44E-08	/	5.00E-03	=	1.89E-05
Strontium	6.30E-06	x	0.00E+00	=	0.00E+00	1.76E-05	/	6.00E-01	=	2.94E-05
Tin	2.74E-06	x	0.00E+00	=	0.00E+00	7.66E-06	/	6.00E-01	=	1.28E-05
Total Uranium	2.98E-07	x	0.00E+00	=	0.00E+00	8.35E-07	/	3.00E-03	=	2.78E-04
Vanadium	1.48E-05	x	0.00E+00	=	0.00E+00	4.14E-05	/	5.00E-03	=	8.28E-03
Zinc	3.49E-05	x	0.00E+00	=	0.00E+00	9.76E-05	/	3.00E-01	=	3.25E-04
Acetone	1.86E-09	x	0.00E+00	=	0.00E+00	5.22E-09	/	9.00E-01	=	5.80E-09
Bis(2-ethylhexyl) phthalate	4.37E-07	x	1.40E-02	=	6.12E-09	1.22E-06	/	2.00E-02	=	6.12E-05
Di-n-butylphthalate	1.64E-07	x	0.00E+00	=	0.00E+00	4.59E-07	/	1.00E-01	=	4.59E-06
Methylene chloride	2.55E-10	x	2.00E-03	=	5.10E-13	7.13E-10	/	6.00E-03	=	1.19E-07
Toluene	5.59E-11	x	0.00E+00	=	0.00E+00	1.56E-10	/	8.00E-02	=	1.96E-09
beta-BHC	4.90E-09	x	1.80E+00	=	8.83E-09	1.37E-08	/	0.00E+00	=	NA
Aroclor-1260	5.09E-09	x	2.00E+00	=	1.02E-08	1.43E-08	/	0.00E+00	=	NA
			Pathway total	=	1.47E-06			Pathway total	=	6.43E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**Unit Risk**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.33E-06	x		=	NA	1.21E-05	/[	5.00E-03	x	1000	]=	2.43E-06
Antimony	1.43E-10	x		=	NA	4.00E-10	/[		x	1000	]=	NA
Arsenic	3.08E-09	x	4.30E-03	=	1.32E-11	8.62E-09	/[	1.50E-05	x	1000	]=	5.74E-07
Barium	4.95E-08	x		=	NA	1.39E-07	/[	5.00E-04	x	1000	]=	2.77E-07
Beryllium	1.68E-10	x	2.40E-03	=	4.03E-13	4.70E-10	/[	2.00E-05	x	1000	]=	2.35E-08
Cadmium	7.34E-11	x	1.80E-03	=	1.32E-13	2.05E-10	/[	1.00E-05	x	1000	]=	2.05E-08
Chromium	7.54E-09	x	8.40E-02	=	6.33E-10	2.11E-08	/[	1.00E-04	x	1000	]=	2.11E-07
Cobalt	5.56E-09	x	9.00E-03	=	5.01E-11	1.56E-08	/[	6.00E-06	x	1000	]=	2.60E-06
Copper	7.76E-09	x		=	NA	2.17E-08	/[		x	1000	]=	NA
Fluoride	1.75E-09	x		=	NA	4.89E-09	/[	1.30E-02	x	1000	]=	3.76E-10
Iron	1.54E-05	x		=	NA	4.31E-05	/[		x	1000	]=	NA
Lithium	5.08E-09	x		=	NA	1.42E-08	/[		x	1000	]=	NA
Manganese	2.21E-07	x		=	NA	6.20E-07	/[	5.00E-05	x	1000	]=	1.24E-05
Mercury	1.17E-11	x	0.00E+00	=	0.00E+00	3.27E-11	/[	3.00E-04	x	1000	]=	1.09E-10
Nickel	6.75E-09	x	2.60E-04	=	1.76E-12	1.89E-08	/[	9.00E-05	x	1000	]=	2.10E-07
Nitrate	6.95E-09	x		=	NA	1.95E-08	/[		x	1000	]=	NA
Nitrite	2.80E-09	x		=	NA	7.84E-09	/[		x	1000	]=	NA
Silver	1.08E-10	x		=	NA	3.02E-10	/[		x	1000	]=	NA
Strontium	2.01E-08	x		=	NA	5.64E-08	/[		x	1000	]=	NA
Tin	8.75E-09	x		=	NA	2.45E-08	/[		x	1000	]=	NA
Total Uranium	9.53E-10	x		=	NA	2.67E-09	/[	4.00E-05	x	1000	]=	6.67E-08
Vanadium	4.72E-08	x		=	NA	1.32E-07	/[	1.00E-04	x	1000	]=	1.32E-06
Zinc	1.11E-07	x		=	NA	3.12E-07	/[		x	1000	]=	NA
Acetone	5.96E-12	x	0.00E+00	=	0.00E+00	1.67E-11	/[	3.10E+01	x	1000	]=	5.38E-16
Bis(2-ethylhexyl) phthalate	1.40E-09	x	2.40E-06	=	3.35E-15	3.91E-09	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	5.24E-10	x	0.00E+00	=	0.00E+00	1.47E-09	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	8.14E-13	x	1.00E-08	=	8.14E-21	2.28E-12	/[	6.00E-01	x	1000	]=	3.80E-15
Toluene	1.79E-13	x	0.00E+00	=	0.00E+00	5.00E-13	/[	5.00E+00	x	1000	]=	1.00E-16
beta-BHC	1.57E-11	x	5.30E-04	=	8.31E-15	4.39E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.63E-11	x	5.70E-04	=	9.28E-15	4.56E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		6.99E-10					Pathway total =		2.01E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.53E-08	x	1.50E+00	=	1.43E-07	2.67E-07	/	3.00E-04	=	8.90E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.58E-11	x		=	NA	2.12E-10	/	2.50E-05	=	8.49E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	1.44E-07	x	1.40E-02	=	2.02E-09	4.04E-07	/	2.00E-02	=	2.02E-05
Di-n-butylphthalate	5.41E-08	x		=	NA	1.52E-07	/	1.00E-01	=	1.52E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	1.62E-09	x	1.80E+00	=	2.91E-09	4.53E-09	/		=	NA
Aroclor-1260	2.35E-09	x	2.00E+00	=	4.71E-09	6.59E-09	/		=	NA
			Pathway total =		1.53E-07			Pathway total =		9.20E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-04
Arsenic	Sum of all pathways	=	1.59E-06	Sum of all pathways	=	9.9E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Beryllium	Sum of all pathways	=	4.03E-13	Sum of all pathways	=	7.4E-05
Cadmium	Sum of all pathways	=	1.32E-13	Sum of all pathways	=	7.3E-05
Chromium	Sum of all pathways	=	6.33E-10	Sum of all pathways	=	2.2E-03
Cobalt	Sum of all pathways	=	5.01E-11	Sum of all pathways	=	1.6E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-10
Nickel	Sum of all pathways	=	1.76E-12	Sum of all pathways	=	3.0E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	8.14E-09	Sum of all pathways	=	8.1E-05
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-06
Methylene chloride	Sum of all pathways	=	5.10E-13	Sum of all pathways	=	1.2E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-09
beta-BHC	Sum of all pathways	=	1.17E-08	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	1.49E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.62E-06	All Pathways and Chemicals	=	6.52E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.59E-03	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	4.66E-08	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.11E-06	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.51E-05	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	3.33E-08	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	6.60E-07	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	2.13E-06	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	2.00E-06	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.81E-06	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	6.71E-07	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.92E-03	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.72E-06	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	7.78E-05	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	2.57E-09	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	2.09E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	7.55E-06	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	1.01E-06	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	1.33E-07	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Silver	1.32E-08	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	7.09E-06	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.25E-07	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	1.22E-05	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	9.24E-06	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	1.22E-09	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.03E-08	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
2-Hexanone	5.27E-10	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	2.66E-10	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	1.13E-10	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.47E-03	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.30E-07	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	3.10E-06	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	4.22E-05	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	9.32E-08	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	1.85E-06	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	5.96E-06	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	5.59E-06	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	7.88E-06	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.88E-06	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.38E-02	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.82E-06	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	2.18E-04	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	7.19E-09	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	5.86E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	2.11E-05	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	2.83E-06	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	3.73E-07	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Silver	3.69E-08	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	1.99E-05	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.51E-07	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	3.42E-05	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.59E-05	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	3.41E-09	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	5.70E-08	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
2-Hexanone	1.47E-09	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	7.45E-10	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	3.15E-10	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.10E-06	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.49E-10	=	[	3.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	3.54E-09	=	[	8.0E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	4.81E-08	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.06E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cadmium	2.11E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	6.81E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	6.38E-09	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	8.99E-09	=	[	2.0E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	2.14E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.57E-05	=	[	3.5E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.50E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.49E-07	=	[	5.6E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	8.20E-12	=	[	1.8E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	6.68E-09	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	2.41E-08	=	[	5.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	3.23E-09	=	[	7.3E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	4.26E-10	=	[	9.6E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Silver	4.22E-11	=	[	9.5E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	2.27E-08	=	[	5.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	4.01E-10	=	[	9.0E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.90E-08	=	[	8.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.95E-08	=	[	6.7E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	3.89E-12	=	[	8.8E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.50E-11	=	[	1.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
2-Hexanone	1.68E-12	=	[	3.8E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Methylene chloride	8.51E-13	=	[	1.9E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	3.60E-13	=	[	8.1E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.43E-05	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.17E-10	=	[	3.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	9.92E-09	=	[	8.0E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.35E-07	=	[	1.1E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	2.98E-10	=	[	2.4E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cadmium	5.90E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.91E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.79E-08	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.52E-08	=	[	2.0E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	6.01E-09	=	[	4.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	4.41E-05	=	[	3.5E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.54E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.96E-07	=	[	5.6E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	2.30E-11	=	[	1.8E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	1.87E-08	=	[	1.5E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	6.75E-08	=	[	5.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	9.03E-09	=	[	7.3E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	1.19E-09	=	[	9.6E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Silver	1.18E-10	=	[	9.5E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	6.35E-08	=	[	5.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.12E-09	=	[	9.0E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	1.09E-07	=	[	8.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	8.27E-08	=	[	6.7E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.09E-11	=	[	8.8E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Butylbenzylphthalate	1.82E-10	=	[	1.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
2-Hexanone	4.71E-12	=	[	3.8E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Methylene chloride	2.38E-12	=	[	1.9E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.01E-12	=	[	8.1E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.10E-07	=	[	5.83E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cadmium	2.18E-09	=	[	3.47E+00	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.71E-09	=	[	1.07E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	3.07E-07	=	[	5.83E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cadmium	6.10E-09	=	[	3.47E+00	x	1.00E-06	x	3,300	x	0.1	x	0.001	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Butylbenzylphthalate	1.88E-08	=	[	1.07E-01	x	1.00E-06	x	3,300	x	0.1	x	0.1	x	1	x	136	x	25	]	/	[	70	x	9,125	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.59E-03	x	0.00E+00	=	0.00E+00	4.47E-03	/	1.00E+00	=	4.47E-03
Antimony	4.66E-08	x	0.00E+00	=	0.00E+00	1.30E-07	/	4.00E-04	=	3.26E-04
Arsenic	1.11E-06	x	1.50E+00	=	1.66E-06	3.10E-06	/	3.00E-04	=	1.03E-02
Barium	1.51E-05	x	0.00E+00	=	0.00E+00	4.22E-05	/	2.00E-01	=	2.11E-04
Beryllium	3.33E-08	x	0.00E+00	=	0.00E+00	9.32E-08	/	2.00E-03	=	4.66E-05
Cadmium	6.60E-07	x	0.00E+00	=	0.00E+00	1.85E-06	/	1.00E-03	=	1.85E-03
Chromium	2.13E-06	x	0.00E+00	=	0.00E+00	5.96E-06	/	3.00E-03	=	1.99E-03
Cobalt	2.00E-06	x	0.00E+00	=	0.00E+00	5.59E-06	/	3.00E-04	=	1.86E-02
Copper	2.81E-06	x	0.00E+00	=	0.00E+00	7.88E-06	/	4.00E-02	=	1.97E-04
Fluoride	6.71E-07	x	0.00E+00	=	0.00E+00	1.88E-06	/	4.00E-02	=	4.70E-05
Iron	4.92E-03	x	0.00E+00	=	0.00E+00	1.38E-02	/	7.00E-01	=	1.97E-02
Lithium	1.72E-06	x	0.00E+00	=	0.00E+00	4.82E-06	/	2.00E-03	=	2.41E-03
Manganese	7.78E-05	x	0.00E+00	=	0.00E+00	2.18E-04	/	1.40E-01	=	1.56E-03
Mercury	2.57E-09	x	0.00E+00	=	0.00E+00	7.19E-09	/	0.00E+00	=	NA
Nickel	2.09E-06	x	0.00E+00	=	0.00E+00	5.86E-06	/	2.00E-02	=	2.93E-04
Nitrate	7.55E-06	x	0.00E+00	=	0.00E+00	2.11E-05	/	1.60E+00	=	1.32E-05
Nitrite	1.01E-06	x	0.00E+00	=	0.00E+00	2.83E-06	/	1.00E-01	=	2.83E-05
Selenium	1.33E-07	x	0.00E+00	=	0.00E+00	3.73E-07	/	5.00E-03	=	7.46E-05
Silver	1.32E-08	x	0.00E+00	=	0.00E+00	3.69E-08	/	5.00E-03	=	7.39E-06
Strontium	7.09E-06	x	0.00E+00	=	0.00E+00	1.99E-05	/	6.00E-01	=	3.31E-05
Total Uranium	1.25E-07	x	0.00E+00	=	0.00E+00	3.51E-07	/	3.00E-03	=	1.17E-04
Vanadium	1.22E-05	x	0.00E+00	=	0.00E+00	3.42E-05	/	5.00E-03	=	6.83E-03
Zinc	9.24E-06	x	0.00E+00	=	0.00E+00	2.59E-05	/	3.00E-01	=	8.62E-05
Acetone	1.22E-09	x	0.00E+00	=	0.00E+00	3.41E-09	/	9.00E-01	=	3.79E-09
Butylbenzylphthalate	2.03E-08	x	1.90E-03	=	3.86E-11	5.70E-08	/	2.00E-01	=	2.85E-07
2-Hexanone	5.27E-10	x	0.00E+00	=	0.00E+00	1.47E-09	/	5.00E-03	=	2.95E-07
Methylene chloride	2.66E-10	x	2.00E-03	=	5.32E-13	7.45E-10	/	6.00E-03	=	1.24E-07
Toluene	1.13E-10	x	0.00E+00	=	0.00E+00	3.15E-10	/	8.00E-02	=	3.94E-09
			Pathway total	=	1.66E-06			Pathway total	=	6.92E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	Unit Risk	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	5.10E-06	x		=	NA	1.43E-05	/[	5.00E-03	x	1000	]=	2.85E-06
Antimony	1.49E-10	x		=	NA	4.17E-10	/[		x	1000	]=	NA
Arsenic	3.54E-09	x	4.30E-03	=	1.52E-11	9.92E-09	/[	1.50E-05	x	1000	]=	6.61E-07
Barium	4.81E-08	x		=	NA	1.35E-07	/[	5.00E-04	x	1000	]=	2.69E-07
Beryllium	1.06E-10	x	2.40E-03	=	2.55E-13	2.98E-10	/[	2.00E-05	x	1000	]=	1.49E-08
Cadmium	2.11E-09	x	1.80E-03	=	3.80E-12	5.90E-09	/[	1.00E-05	x	1000	]=	5.90E-07
Chromium	6.81E-09	x	8.40E-02	=	5.72E-10	1.91E-08	/[	1.00E-04	x	1000	]=	1.91E-07
Cobalt	6.38E-09	x	9.00E-03	=	5.74E-11	1.79E-08	/[	6.00E-06	x	1000	]=	2.98E-06
Copper	8.99E-09	x		=	NA	2.52E-08	/[		x	1000	]=	NA
Fluoride	2.14E-09	x		=	NA	6.01E-09	/[	1.30E-02	x	1000	]=	4.62E-10
Iron	1.57E-05	x		=	NA	4.41E-05	/[		x	1000	]=	NA
Lithium	5.50E-09	x		=	NA	1.54E-08	/[		x	1000	]=	NA
Manganese	2.49E-07	x		=	NA	6.96E-07	/[	5.00E-05	x	1000	]=	1.39E-05
Mercury	8.20E-12	x	0.00E+00	=	0.00E+00	2.30E-11	/[	3.00E-04	x	1000	]=	7.66E-11
Nickel	6.68E-09	x	2.60E-04	=	1.74E-12	1.87E-08	/[	9.00E-05	x	1000	]=	2.08E-07
Nitrate	2.41E-08	x		=	NA	6.75E-08	/[		x	1000	]=	NA
Nitrite	3.23E-09	x		=	NA	9.03E-09	/[		x	1000	]=	NA
Selenium	4.26E-10	x	0.00E+00	=	0.00E+00	1.19E-09	/[	2.00E-02	x	1000	]=	5.96E-11
Silver	4.22E-11	x		=	NA	1.18E-10	/[		x	1000	]=	NA
Strontium	2.27E-08	x		=	NA	6.35E-08	/[		x	1000	]=	NA
Total Uranium	4.01E-10	x		=	NA	1.12E-09	/[	4.00E-05	x	1000	]=	2.81E-08
Vanadium	3.90E-08	x		=	NA	1.09E-07	/[	1.00E-04	x	1000	]=	1.09E-06
Zinc	2.95E-08	x		=	NA	8.27E-08	/[		x	1000	]=	NA
Acetone	3.89E-12	x	0.00E+00	=	0.00E+00	1.09E-11	/[	3.10E+01	x	1000	]=	3.51E-16
Butylbenzylphthalate	6.50E-11	x	0.00E+00	=	0.00E+00	1.82E-10	/[		x	1000	]=	NA
2-Hexanone	1.68E-12	x	0.00E+00	=	0.00E+00	4.71E-12	/[	3.00E-02	x	1000	]=	1.57E-13
Methylene chloride	8.51E-13	x	1.00E-08	=	8.51E-21	2.38E-12	/[	6.00E-01	x	1000	]=	3.97E-15
Toluene	3.60E-13	x	0.00E+00	=	0.00E+00	1.01E-12	/	5.00E+00	x	1000	]=	2.01E-16
			Pathway total =		6.50E-10					Pathway total =		2.28E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.10E-07	x	1.50E+00	=	1.65E-07	3.07E-07	/	3.00E-04	=	1.02E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.18E-09	x		=	NA	6.10E-09	/	2.50E-05	=	2.44E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	6.71E-09	x	1.90E-03	=	1.28E-11	1.88E-08	/	2.00E-01	=	9.40E-08
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.65E-07			Pathway total =		1.27E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-04
Arsenic	Sum of all pathways	=	1.83E-06	Sum of all pathways	=	1.1E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Beryllium	Sum of all pathways	=	2.55E-13	Sum of all pathways	=	4.7E-05
Cadmium	Sum of all pathways	=	3.80E-12	Sum of all pathways	=	2.1E-03
Chromium	Sum of all pathways	=	5.72E-10	Sum of all pathways	=	2.0E-03
Cobalt	Sum of all pathways	=	5.74E-11	Sum of all pathways	=	1.9E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-11
Nickel	Sum of all pathways	=	1.74E-12	Sum of all pathways	=	2.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-09
Butylbenzylphthalate	Sum of all pathways	=	5.14E-11	Sum of all pathways	=	3.8E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-07
Methylene chloride	Sum of all pathways	=	5.32E-13	Sum of all pathways	=	1.2E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	1.83E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	7.05E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Unit, Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.57E-03	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	5.53E-08	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.33E-06	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Barium	1.84E-05	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	4.47E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Boron	1.22E-06	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	1.90E-06	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	1.66E-06	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Copper	2.51E-06	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	3.84E-07	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Iron	4.39E-03	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	1.76E-06	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	6.92E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	3.92E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	4.81E-07	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	1.86E-06	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	1.62E-06	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	4.16E-07	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	3.80E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	9.43E-06	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	1.17E-07	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	9.87E-06	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	8.61E-06	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	1.17E-09	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Benzene	6.24E-11	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	7.17E-11	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	1.40E-10	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.40E-03	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	1.55E-07	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	3.73E-06	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Barium	5.16E-05	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	1.25E-07	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Boron	3.42E-06	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	5.32E-06	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	4.65E-06	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Copper	7.03E-06	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	1.08E-06	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Iron	1.23E-02	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	4.92E-06	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	1.94E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	1.10E-08	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	1.35E-06	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	5.22E-06	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	4.53E-06	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	1.17E-06	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	1.06E-06	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	2.64E-05	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	3.29E-07	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	2.76E-05	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	2.41E-05	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	3.29E-09	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Benzene	1.75E-10	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	2.01E-10	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	3.93E-10	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	136	x	25	]	/	[	70	x	9,125	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Unit, Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.03E-06	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Antimony	1.77E-10	=	[	4.0E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Arsenic	4.25E-09	=	[	9.6E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Barium	5.89E-08	=	[	1.3E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Beryllium	1.43E-10	=	[	3.2E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Boron	3.90E-09	=	[	8.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Chromium	6.08E-09	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Cobalt	5.30E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Copper	8.02E-09	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Fluoride	1.23E-09	=	[	2.8E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Iron	1.40E-05	=	[	3.2E-04	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Lithium	5.61E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Manganese	2.21E-07	=	[	5.0E-06	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Mercury	1.25E-11	=	[	2.8E-10	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Molybdenum	1.54E-09	=	[	3.5E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nickel	5.95E-09	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrate	5.17E-09	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Nitrite	1.33E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Selenium	1.22E-09	=	[	2.7E-08	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Strontium	3.01E-08	=	[	6.8E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Total Uranium	3.75E-10	=	[	8.5E-09	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Vanadium	3.15E-08	=	[	7.1E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Zinc	2.75E-08	=	[	6.2E-07	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Acetone	3.76E-12	=	[	8.5E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Benzene	1.99E-13	=	[	4.5E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Styrene	2.29E-13	=	[	5.2E-12	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]
Toluene	4.48E-13	=	[	1.0E-11	x	136	x	8.0	x	25	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.41E-05	=	[	1.1E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Antimony	4.95E-10	=	[	4.0E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Arsenic	1.19E-08	=	[	9.6E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Barium	1.65E-07	=	[	1.3E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Beryllium	4.00E-10	=	[	3.2E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Boron	1.09E-08	=	[	8.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Chromium	1.70E-08	=	[	1.4E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Cobalt	1.49E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Copper	2.25E-08	=	[	1.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Fluoride	3.44E-09	=	[	2.8E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Iron	3.93E-05	=	[	3.2E-04	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Lithium	1.57E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Manganese	6.19E-07	=	[	5.0E-06	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Mercury	3.50E-11	=	[	2.8E-10	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Molybdenum	4.30E-09	=	[	3.5E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nickel	1.67E-08	=	[	1.3E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrate	1.45E-08	=	[	1.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Nitrite	3.73E-09	=	[	3.0E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Selenium	3.40E-09	=	[	2.7E-08	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Strontium	8.44E-08	=	[	6.8E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Total Uranium	1.05E-09	=	[	8.5E-09	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Vanadium	8.83E-08	=	[	7.1E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Zinc	7.71E-08	=	[	6.2E-07	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Acetone	1.05E-11	=	[	8.5E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Benzene	5.58E-13	=	[	4.5E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Styrene	6.41E-13	=	[	5.2E-12	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]
Toluene	1.26E-12	=	[	1.0E-11	x	136	x	8.0	x	25	]	/	[(	9,125	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Maintenance/ Surveillance Worker
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Unit, Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Arsenic	1.32E-07	=	[	7.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,300	x	0.1	x	0	x	1	x	136	x	25	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Arsenic	3.69E-07	=	[	7.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0.03	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	3,300	x	0.1	x		x	1	x	136	x	25	]	/	[	70	x	9,125	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	3,300	x	0.1	x	0.00	x	1	x	136	x	25	]	/	[	70	x	9,125	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Maintenance/ Surveillance Worker Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U

Waste Management Unit, Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.57E-03	x	0.00E+00	=	0.00E+00	4.40E-03	/	1.00E+00	=	4.40E-03
Antimony	5.53E-08	x	0.00E+00	=	0.00E+00	1.55E-07	/	4.00E-04	=	3.87E-04
Arsenic	1.33E-06	x	1.50E+00	=	2.00E-06	3.73E-06	/	3.00E-04	=	1.24E-02
Barium	1.84E-05	x	0.00E+00	=	0.00E+00	5.16E-05	/	2.00E-01	=	2.58E-04
Beryllium	4.47E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	2.00E-03	=	6.25E-05
Boron	1.22E-06	x	0.00E+00	=	0.00E+00	3.42E-06	/	2.00E-01	=	1.71E-05
Chromium	1.90E-06	x	0.00E+00	=	0.00E+00	5.32E-06	/	3.00E-03	=	1.77E-03
Cobalt	1.66E-06	x	0.00E+00	=	0.00E+00	4.65E-06	/	3.00E-04	=	1.55E-02
Copper	2.51E-06	x	0.00E+00	=	0.00E+00	7.03E-06	/	4.00E-02	=	1.76E-04
Fluoride	3.84E-07	x	0.00E+00	=	0.00E+00	1.08E-06	/	4.00E-02	=	2.69E-05
Iron	4.39E-03	x	0.00E+00	=	0.00E+00	1.23E-02	/	7.00E-01	=	1.76E-02
Lithium	1.76E-06	x	0.00E+00	=	0.00E+00	4.92E-06	/	2.00E-03	=	2.46E-03
Manganese	6.92E-05	x	0.00E+00	=	0.00E+00	1.94E-04	/	1.40E-01	=	1.38E-03
Mercury	3.92E-09	x	0.00E+00	=	0.00E+00	1.10E-08	/	0.00E+00	=	NA
Molybdenum	4.81E-07	x	0.00E+00	=	0.00E+00	1.35E-06	/	5.00E-03	=	2.69E-04
Nickel	1.86E-06	x	0.00E+00	=	0.00E+00	5.22E-06	/	2.00E-02	=	2.61E-04
Nitrate	1.62E-06	x	0.00E+00	=	0.00E+00	4.53E-06	/	1.60E+00	=	2.83E-06
Nitrite	4.16E-07	x	0.00E+00	=	0.00E+00	1.17E-06	/	1.00E-01	=	1.17E-05
Selenium	3.80E-07	x	0.00E+00	=	0.00E+00	1.06E-06	/	5.00E-03	=	2.13E-04
Strontium	9.43E-06	x	0.00E+00	=	0.00E+00	2.64E-05	/	6.00E-01	=	4.40E-05
Total Uranium	1.17E-07	x	0.00E+00	=	0.00E+00	3.29E-07	/	3.00E-03	=	1.10E-04
Vanadium	9.87E-06	x	0.00E+00	=	0.00E+00	2.76E-05	/	5.00E-03	=	5.53E-03
Zinc	8.61E-06	x	0.00E+00	=	0.00E+00	2.41E-05	/	3.00E-01	=	8.04E-05
Acetone	1.17E-09	x	0.00E+00	=	0.00E+00	3.29E-09	/	9.00E-01	=	3.66E-09
Benzene	6.24E-11	x	5.50E-02	=	3.43E-12	1.75E-10	/	4.00E-03	=	4.36E-08
Styrene	7.17E-11	x	0.00E+00	=	0.00E+00	2.01E-10	/	2.00E-01	=	1.00E-09
Toluene	1.40E-10	x	0.00E+00	=	0.00E+00	3.93E-10	/	8.00E-02	=	4.91E-09
			Pathway total	=	2.00E-06			Pathway total	=	6.29E-02

Inhalation of Chemicals in Soil

Equation	EC	x	Unit Risk	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	5.03E-06	x		=	NA	1.41E-05	/[	5.00E-03	x	1000	]=	2.81E-06
Antimony	1.77E-10	x		=	NA	4.95E-10	/[		x	1000	]=	NA
Arsenic	4.25E-09	x	4.30E-03	=	1.83E-11	1.19E-08	/[	1.50E-05	x	1000	]=	7.94E-07
Barium	5.89E-08	x		=	NA	1.65E-07	/[	5.00E-04	x	1000	]=	3.30E-07
Beryllium	1.43E-10	x	2.40E-03	=	3.43E-13	4.00E-10	/[	2.00E-05	x	1000	]=	2.00E-08
Boron	3.90E-09	x	0.00E+00	=	0.00E+00	1.09E-08	/[	2.00E-02	x	1000	]=	5.46E-10
Chromium	6.08E-09	x	8.40E-02	=	5.10E-10	1.70E-08	/[	1.00E-04	x	1000	]=	1.70E-07
Cobalt	5.30E-09	x	9.00E-03	=	4.77E-11	1.49E-08	/[	6.00E-06	x	1000	]=	2.48E-06
Copper	8.02E-09	x		=	NA	2.25E-08	/[		x	1000	]=	NA
Fluoride	1.23E-09	x		=	NA	3.44E-09	/[	1.30E-02	x	1000	]=	2.64E-10
Iron	1.40E-05	x		=	NA	3.93E-05	/[		x	1000	]=	NA
Lithium	5.61E-09	x		=	NA	1.57E-08	/[		x	1000	]=	NA
Manganese	2.21E-07	x		=	NA	6.19E-07	/[	5.00E-05	x	1000	]=	1.24E-05
Mercury	1.25E-11	x	0.00E+00	=	0.00E+00	3.50E-11	/[	3.00E-04	x	1000	]=	1.17E-10
Molybdenum	1.54E-09	x	0.00E+00	=	0.00E+00	4.30E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	5.95E-09	x	2.60E-04	=	1.55E-12	1.67E-08	/[	9.00E-05	x	1000	]=	1.85E-07
Nitrate	5.17E-09	x		=	NA	1.45E-08	/[		x	1000	]=	NA
Nitrite	1.33E-09	x		=	NA	3.73E-09	/[		x	1000	]=	NA
Selenium	1.22E-09	x	0.00E+00	=	0.00E+00	3.40E-09	/[	2.00E-02	x	1000	]=	1.70E-10
Strontium	3.01E-08	x		=	NA	8.44E-08	/[		x	1000	]=	NA
Total Uranium	3.75E-10	x		=	NA	1.05E-09	/[	4.00E-05	x	1000	]=	2.63E-08
Vanadium	3.15E-08	x		=	NA	8.83E-08	/[	1.00E-04	x	1000	]=	8.83E-07
Zinc	2.75E-08	x		=	NA	7.71E-08	/[		x	1000	]=	NA
Acetone	3.76E-12	x	0.00E+00	=	0.00E+00	1.05E-11	/[	3.10E+01	x	1000	]=	3.39E-16
Benzene	1.99E-13	x	7.80E-06	=	1.55E-18	5.58E-13	/[	3.00E-02	x	1000	]=	1.86E-14
Styrene	2.29E-13	x	0.00E+00	=	0.00E+00	6.41E-13	/[	1.00E+00	x	1000	]=	6.41E-16
Toluene	4.48E-13	x	0.00E+00	=	0.00E+00	1.26E-12	/[	5.00E+00	x	1000	]=	2.51E-16
			Pathway total =		5.78E-10					Pathway total =		2.01E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.32E-07	x	1.50E+00	=	1.98E-07	3.69E-07	/	3.00E-04	=	1.23E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.98E-07			Pathway total =		1.23E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-04
Arsenic	Sum of all pathways	=	2.19E-06	Sum of all pathways	=	1.4E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Beryllium	Sum of all pathways	=	3.43E-13	Sum of all pathways	=	6.3E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Chromium	Sum of all pathways	=	5.10E-10	Sum of all pathways	=	1.8E-03
Cobalt	Sum of all pathways	=	4.77E-11	Sum of all pathways	=	1.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-10
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04
Nickel	Sum of all pathways	=	1.55E-12	Sum of all pathways	=	2.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-09
Benzene	Sum of all pathways	=	3.43E-12	Sum of all pathways	=	4.4E-08
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	2.19E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	6.42E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Adult Maintenance/ Surveillance Worker

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	1E-06	6E-06	1E-06	1E-06	1E-06	2E-06	1E-06	1E-06	2E-06	2E-06
Inhalation	5E-10	8E-10	9E-10	5E-10	9E-10	7E-10	6E-10	7E-10	7E-10	6E-10
Dermal Contact	1E-07	6E-07	1E-07	1E-07	1E-07	2E-07	1E-07	2E-07	2E-07	2E-07
ELCR	1E-06	7E-06	2E-06	1E-06	2E-06	2E-06	1E-06	2E-06	2E-06	2E-06
Major Risk Contributors	None									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	0.06	0.10	0.06	0.06	0.07	0.07	0.05	0.06	0.07	0.06
Inhalation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dermal Contact	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HI	0.06	0.1	0.07	0.06	0.07	0.1	0.05	0.07	0.1	0.1
Major Hazard Contributors	None									

Appendix C
Attachment C-5: Results of Nonradiological Risk Assessment under Adult Trespasser Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.62E-04	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.70E-09	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	8.05E-08	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.83E-06	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.08E-09	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.05E-07	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.95E-07	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.74E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	4.78E-08	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.17E-04	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.79E-07	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	7.60E-06	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.33E-07	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.95E-07	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	1.99E-08	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.04E-09	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	8.10E-07	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Tin	2.49E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.24E-08	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.29E-06	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	9.79E-07	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Diethylphthalate	7.30E-09	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1254	1.62E-10	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.73E-04	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.66E-08	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.35E-07	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	5.32E-06	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	6.06E-09	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	5.97E-07	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.69E-07	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	7.99E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.39E-07	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.51E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.22E-07	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.22E-05	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	6.79E-07	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	5.68E-07	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	5.79E-08	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	3.02E-09	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.36E-06	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Tin	7.26E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	3.61E-08	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	3.76E-06	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.85E-06	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Diethylphthalate	2.13E-08	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1254	4.72E-10	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	5.18E-07	=	[	1.0E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.82E-11	=	[	3.6E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	2.57E-10	=	[	5.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	5.83E-09	=	[	1.2E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	6.64E-12	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	6.54E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	6.24E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	8.75E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.53E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.65E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	5.72E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.43E-08	=	[	4.8E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	7.44E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	6.22E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	6.35E-11	=	[	1.3E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	3.31E-12	=	[	6.6E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.59E-09	=	[	5.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Tin	7.96E-10	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	3.96E-11	=	[	7.9E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.12E-09	=	[	8.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.13E-09	=	[	6.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Diethylphthalate	2.33E-11	=	[	4.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Aroclor-1254	5.17E-13	=	[	1.0E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.51E-06	=	[	1.0E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	5.31E-11	=	[	3.6E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	7.51E-10	=	[	5.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.70E-08	=	[	1.2E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	1.94E-11	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	1.91E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.82E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.55E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	4.45E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.82E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.67E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.09E-08	=	[	4.8E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.17E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.81E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	1.85E-10	=	[	1.3E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	9.66E-12	=	[	6.6E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	7.55E-09	=	[	5.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Tin	2.32E-09	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.16E-10	=	[	7.9E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.20E-08	=	[	8.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	9.13E-09	=	[	6.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Diethylphthalate	6.81E-11	=	[	4.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Aroclor-1254	1.51E-12	=	[	1.0E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	9.64E-09	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	8.29E-12	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Diethylphthalate	2.91E-09	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1254	9.04E-11	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.81E-08	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.42E-11	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Diethylphthalate	8.50E-09	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1254	2.64E-10	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.62E-04	x	0.00E+00	=	0.00E+00	4.73E-04	/	1.00E+00	=	4.73E-04
Antimony	5.70E-09	x	0.00E+00	=	0.00E+00	1.66E-08	/	4.00E-04	=	4.15E-05
Arsenic	8.05E-08	x	1.50E+00	=	1.21E-07	2.35E-07	/	3.00E-04	=	7.83E-04
Barium	1.83E-06	x	0.00E+00	=	0.00E+00	5.32E-06	/	2.00E-01	=	2.66E-05
Cadmium	2.08E-09	x	0.00E+00	=	0.00E+00	6.06E-09	/	1.00E-03	=	6.06E-06
Chromium	2.05E-07	x	0.00E+00	=	0.00E+00	5.97E-07	/	3.00E-03	=	1.99E-04
Cobalt	1.95E-07	x	0.00E+00	=	0.00E+00	5.69E-07	/	3.00E-04	=	1.90E-03
Copper	2.74E-07	x	0.00E+00	=	0.00E+00	7.99E-07	/	4.00E-02	=	2.00E-05
Fluoride	4.78E-08	x	0.00E+00	=	0.00E+00	1.39E-07	/	4.00E-02	=	3.48E-06
Iron	5.17E-04	x	0.00E+00	=	0.00E+00	1.51E-03	/	7.00E-01	=	2.15E-03
Lithium	1.79E-07	x	0.00E+00	=	0.00E+00	5.22E-07	/	2.00E-03	=	2.61E-04
Manganese	7.60E-06	x	0.00E+00	=	0.00E+00	2.22E-05	/	1.40E-01	=	1.58E-04
Nickel	2.33E-07	x	0.00E+00	=	0.00E+00	6.79E-07	/	2.00E-02	=	3.40E-05
Nitrate	1.95E-07	x	0.00E+00	=	0.00E+00	5.68E-07	/	1.60E+00	=	3.55E-07
Nitrite	1.99E-08	x	0.00E+00	=	0.00E+00	5.79E-08	/	1.00E-01	=	5.79E-07
Silver	1.04E-09	x	0.00E+00	=	0.00E+00	3.02E-09	/	5.00E-03	=	6.05E-07
Strontium	8.10E-07	x	0.00E+00	=	0.00E+00	2.36E-06	/	6.00E-01	=	3.94E-06
Tin	2.49E-07	x	0.00E+00	=	0.00E+00	7.26E-07	/	6.00E-01	=	1.21E-06
Total Uranium	1.24E-08	x	0.00E+00	=	0.00E+00	3.61E-08	/	3.00E-03	=	1.20E-05
Vanadium	1.29E-06	x	0.00E+00	=	0.00E+00	3.76E-06	/	5.00E-03	=	7.51E-04
Zinc	9.79E-07	x	0.00E+00	=	0.00E+00	2.85E-06	/	3.00E-01	=	9.52E-06
Diethylphthalate	7.30E-09	x	0.00E+00	=	0.00E+00	2.13E-08	/	8.00E-01	=	2.66E-08
Aroclor-1254	1.62E-10	x	2.00E+00	=	3.24E-10	4.72E-10	/	2.00E-05	=	2.36E-05
			Pathway total	=	1.21E-07			Pathway total	=	6.86E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	5.18E-07	x		=	NA	1.51E-06	/[	5.00E-03	x	1000	]=	3.02E-07
Antimony	1.82E-11	x		=	NA	5.31E-11	/[		x	1000	]=	NA
Arsenic	2.57E-10	x	4.30E-03	=	1.11E-12	7.51E-10	/[	1.50E-05	x	1000	]=	5.01E-08
Barium	5.83E-09	x		=	NA	1.70E-08	/[	5.00E-04	x	1000	]=	3.40E-08
Cadmium	6.64E-12	x	1.80E-03	=	1.19E-14	1.94E-11	/[	1.00E-05	x	1000	]=	1.94E-09
Chromium	6.54E-10	x	8.40E-02	=	5.50E-11	1.91E-09	/[	1.00E-04	x	1000	]=	1.91E-08
Cobalt	6.24E-10	x	9.00E-03	=	5.62E-12	1.82E-09	/[	6.00E-06	x	1000	]=	3.03E-07
Copper	8.75E-10	x		=	NA	2.55E-09	/[		x	1000	]=	NA
Fluoride	1.53E-10	x		=	NA	4.45E-10	/[	1.30E-02	x	1000	]=	3.43E-11
Iron	1.65E-06	x		=	NA	4.82E-06	/[		x	1000	]=	NA
Lithium	5.72E-10	x		=	NA	1.67E-09	/[		x	1000	]=	NA
Manganese	2.43E-08	x		=	NA	7.09E-08	/[	5.00E-05	x	1000	]=	1.42E-06
Nickel	7.44E-10	x	2.60E-04	=	1.93E-13	2.17E-09	/[	9.00E-05	x	1000	]=	2.41E-08
Nitrate	6.22E-10	x		=	NA	1.81E-09	/[		x	1000	]=	NA
Nitrite	6.35E-11	x		=	NA	1.85E-10	/[		x	1000	]=	NA
Silver	3.31E-12	x		=	NA	9.66E-12	/[		x	1000	]=	NA
Strontium	2.59E-09	x		=	NA	7.55E-09	/[		x	1000	]=	NA
Tin	7.96E-10	x		=	NA	2.32E-09	/[		x	1000	]=	NA
Total Uranium	3.96E-11	x		=	NA	1.16E-10	/[	4.00E-05	x	1000	]=	2.89E-09
Vanadium	4.12E-09	x		=	NA	1.20E-08	/[	1.00E-04	x	1000	]=	1.20E-07
Zinc	3.13E-09	x		=	NA	9.13E-09	/[		x	1000	]=	NA
Diethylphthalate	2.33E-11	x		=	NA	6.81E-11	/[		x	1000	]=	NA
Aroclor-1254	5.17E-13	x	5.70E-04	=	2.95E-16	1.51E-12	/[		x	1000	]=	NA
			Pathway total =		6.19E-11					Pathway total =		2.27E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.64E-09	x	1.50E+00	=	1.45E-08	2.81E-08	/	3.00E-04	=	9.37E-05
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	8.29E-12	x		=	NA	2.42E-11	/	2.50E-05	=	9.67E-07
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	2.91E-09	x		=	NA	8.50E-09	/	8.00E-01	=	1.06E-08
Aroclor-1254	9.04E-11	x	2.00E+00	=	1.81E-10	2.64E-10	/	2.00E-05	=	1.32E-05
			Pathway total =		1.46E-08			Pathway total =		1.08E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-05
Arsenic	Sum of all pathways	=	1.35E-07	Sum of all pathways	=	8.8E-04
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05
Cadmium	Sum of all pathways	=	1.19E-14	Sum of all pathways	=	7.0E-06
Chromium	Sum of all pathways	=	5.50E-11	Sum of all pathways	=	2.0E-04
Cobalt	Sum of all pathways	=	5.62E-12	Sum of all pathways	=	1.9E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Nickel	Sum of all pathways	=	1.93E-13	Sum of all pathways	=	3.4E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-07
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-07
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-06
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-06
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-08
Aroclor-1254	Sum of all pathways	=	5.05E-10	Sum of all pathways	=	3.7E-05

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.36E-07	All Pathways and Chemicals	=	6.97E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.04E-04	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	1.55E-08	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	4.55E-07	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	2.12E-06	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	8.65E-09	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	3.22E-09	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.75E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	2.36E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	3.89E-07	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	4.92E-08	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	6.14E-04	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	2.60E-07	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	9.64E-06	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	1.09E-10	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.79E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	3.74E-07	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	4.53E-08	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.72E-09	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	9.60E-07	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.82E-08	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.69E-06	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	1.10E-06	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.73E-09	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	5.96E-04	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	4.52E-08	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	1.33E-06	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	6.19E-06	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	2.52E-08	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	9.39E-09	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	8.02E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	6.89E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	1.13E-06	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.43E-07	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.79E-03	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	7.58E-07	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.81E-05	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	3.17E-10	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	8.14E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	1.09E-06	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	1.32E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	5.01E-09	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.80E-06	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	5.29E-08	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	4.92E-06	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	3.20E-06	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	5.05E-09	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	6.53E-07	=	[	1.3E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	4.95E-11	=	[	9.9E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	1.45E-09	=	[	2.9E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	6.78E-09	=	[	1.4E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	2.77E-11	=	[	5.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	1.03E-11	=	[	2.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	8.78E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	7.55E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	1.24E-09	=	[	2.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.57E-10	=	[	3.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.96E-06	=	[	3.9E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	8.30E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	3.08E-08	=	[	6.2E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	3.47E-13	=	[	6.9E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	8.92E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	1.19E-09	=	[	2.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	1.45E-10	=	[	2.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	5.49E-12	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	3.07E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	5.80E-11	=	[	1.2E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	5.39E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.51E-09	=	[	7.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	5.54E-12	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.90E-06	=	[	1.3E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	1.44E-10	=	[	9.9E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	4.24E-09	=	[	2.9E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.98E-08	=	[	1.4E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	8.07E-11	=	[	5.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	3.00E-11	=	[	2.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	2.56E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	2.20E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	3.62E-09	=	[	2.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	4.58E-10	=	[	3.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	5.72E-06	=	[	3.9E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	2.42E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	8.99E-08	=	[	6.2E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	1.01E-12	=	[	6.9E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.60E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	3.48E-09	=	[	2.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	4.22E-10	=	[	2.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.60E-11	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	8.95E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.69E-10	=	[	1.2E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.57E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	1.02E-08	=	[	7.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	1.62E-11	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	5.45E-08	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	1.29E-11	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.91E-10	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	1.59E-07	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	3.75E-11	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	2.02E-09	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.04E-04	x	0.00E+00	=	0.00E+00	5.96E-04	/	1.00E+00	=	5.96E-04
Antimony	1.55E-08	x	0.00E+00	=	0.00E+00	4.52E-08	/	4.00E-04	=	1.13E-04
Arsenic	4.55E-07	x	1.50E+00	=	6.83E-07	1.33E-06	/	3.00E-04	=	4.43E-03
Barium	2.12E-06	x	0.00E+00	=	0.00E+00	6.19E-06	/	2.00E-01	=	3.09E-05
Beryllium	8.65E-09	x	0.00E+00	=	0.00E+00	2.52E-08	/	2.00E-03	=	1.26E-05
Cadmium	3.22E-09	x	0.00E+00	=	0.00E+00	9.39E-09	/	1.00E-03	=	9.39E-06
Chromium	2.75E-07	x	0.00E+00	=	0.00E+00	8.02E-07	/	3.00E-03	=	2.67E-04
Cobalt	2.36E-07	x	0.00E+00	=	0.00E+00	6.89E-07	/	3.00E-04	=	2.30E-03
Copper	3.89E-07	x	0.00E+00	=	0.00E+00	1.13E-06	/	4.00E-02	=	2.83E-05
Fluoride	4.92E-08	x	0.00E+00	=	0.00E+00	1.43E-07	/	4.00E-02	=	3.59E-06
Iron	6.14E-04	x	0.00E+00	=	0.00E+00	1.79E-03	/	7.00E-01	=	2.56E-03
Lithium	2.60E-07	x	0.00E+00	=	0.00E+00	7.58E-07	/	2.00E-03	=	3.79E-04
Manganese	9.64E-06	x	0.00E+00	=	0.00E+00	2.81E-05	/	1.40E-01	=	2.01E-04
Mercury	1.09E-10	x	0.00E+00	=	0.00E+00	3.17E-10	/	0.00E+00	=	NA
Nickel	2.79E-07	x	0.00E+00	=	0.00E+00	8.14E-07	/	2.00E-02	=	4.07E-05
Nitrate	3.74E-07	x	0.00E+00	=	0.00E+00	1.09E-06	/	1.60E+00	=	6.81E-07
Nitrite	4.53E-08	x	0.00E+00	=	0.00E+00	1.32E-07	/	1.00E-01	=	1.32E-06
Silver	1.72E-09	x	0.00E+00	=	0.00E+00	5.01E-09	/	5.00E-03	=	1.00E-06
Strontium	9.60E-07	x	0.00E+00	=	0.00E+00	2.80E-06	/	6.00E-01	=	4.67E-06
Total Uranium	1.82E-08	x	0.00E+00	=	0.00E+00	5.29E-08	/	3.00E-03	=	1.76E-05
Vanadium	1.69E-06	x	0.00E+00	=	0.00E+00	4.92E-06	/	5.00E-03	=	9.83E-04
Zinc	1.10E-06	x	0.00E+00	=	0.00E+00	3.20E-06	/	3.00E-01	=	1.07E-05
Butylbenzylphthalate	1.73E-09	x	1.90E-03	=	3.29E-12	5.05E-09	/	2.00E-01	=	2.53E-08
			Pathway total	=	6.83E-07			Pathway total	=	1.20E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	6.53E-07	x		=	NA	1.90E-06	/[	5.00E-03	x	1000	]=	3.81E-07
Antimony	4.95E-11	x		=	NA	1.44E-10	/[		x	1000	]=	NA
Arsenic	1.45E-09	x	4.30E-03	=	6.26E-12	4.24E-09	/[	1.50E-05	x	1000	]=	2.83E-07
Barium	6.78E-09	x		=	NA	1.98E-08	/[	5.00E-04	x	1000	]=	3.96E-08
Beryllium	2.77E-11	x	2.40E-03	=	6.64E-14	8.07E-11	/[	2.00E-05	x	1000	]=	4.03E-09
Cadmium	1.03E-11	x	1.80E-03	=	1.85E-14	3.00E-11	/[	1.00E-05	x	1000	]=	3.00E-09
Chromium	8.78E-10	x	8.40E-02	=	7.38E-11	2.56E-09	/[	1.00E-04	x	1000	]=	2.56E-08
Cobalt	7.55E-10	x	9.00E-03	=	6.79E-12	2.20E-09	/[	6.00E-06	x	1000	]=	3.67E-07
Copper	1.24E-09	x		=	NA	3.62E-09	/[		x	1000	]=	NA
Fluoride	1.57E-10	x		=	NA	4.58E-10	/[	1.30E-02	x	1000	]=	3.53E-11
Iron	1.96E-06	x		=	NA	5.72E-06	/[		x	1000	]=	NA
Lithium	8.30E-10	x		=	NA	2.42E-09	/[		x	1000	]=	NA
Manganese	3.08E-08	x		=	NA	8.99E-08	/[	5.00E-05	x	1000	]=	1.80E-06
Mercury	3.47E-13	x	0.00E+00	=	0.00E+00	1.01E-12	/[	3.00E-04	x	1000	]=	3.38E-12
Nickel	8.92E-10	x	2.60E-04	=	2.32E-13	2.60E-09	/[	9.00E-05	x	1000	]=	2.89E-08
Nitrate	1.19E-09	x		=	NA	3.48E-09	/[		x	1000	]=	NA
Nitrite	1.45E-10	x		=	NA	4.22E-10	/[		x	1000	]=	NA
Silver	5.49E-12	x		=	NA	1.60E-11	/[		x	1000	]=	NA
Strontium	3.07E-09	x		=	NA	8.95E-09	/[		x	1000	]=	NA
Total Uranium	5.80E-11	x		=	NA	1.69E-10	/[	4.00E-05	x	1000	]=	4.23E-09
Vanadium	5.39E-09	x		=	NA	1.57E-08	/[	1.00E-04	x	1000	]=	1.57E-07
Zinc	3.51E-09	x				1.02E-08	/[		x	1000	]=	NA
Butylbenzylphthalate	5.54E-12	x	0.00E+00	=	0.00E+00	1.62E-11	/		x	1000	]=	NA
			Pathway total =		8.72E-11					Pathway total =		3.09E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.45E-08	x	1.50E+00	=	8.17E-08	1.59E-07	/	3.00E-04	=	5.30E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.29E-11	x		=	NA	3.75E-11	/	2.50E-05	=	1.50E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	6.91E-10	x	1.90E-03	=	1.31E-12	2.02E-09	/	2.00E-01	=	1.01E-08
			Pathway total =		8.17E-08			Pathway total =		5.31E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Arsenic	Sum of all pathways	=	7.64E-07	Sum of all pathways	=	5.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-05
Beryllium	Sum of all pathways	=	6.64E-14	Sum of all pathways	=	1.3E-05
Cadmium	Sum of all pathways	=	1.85E-14	Sum of all pathways	=	1.1E-05
Chromium	Sum of all pathways	=	7.38E-11	Sum of all pathways	=	2.7E-04
Cobalt	Sum of all pathways	=	6.79E-12	Sum of all pathways	=	2.3E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-12
Nickel	Sum of all pathways	=	2.32E-13	Sum of all pathways	=	4.1E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	9.8E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-05
Butylbenzylphthalate	Sum of all pathways	=	4.61E-12	Sum of all pathways	=	3.5E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	7.65E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.25E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.59E-04	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	3.82E-09	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.12E-07	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.68E-06	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	3.41E-09	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Boron	7.17E-08	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	7.00E-08	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	3.69E-07	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.89E-07	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	3.54E-07	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	3.18E-08	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.20E-04	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.96E-07	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	1.06E-05	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	4.98E-10	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.66E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.08E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	3.01E-08	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	1.20E-08	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.82E-09	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	7.45E-07	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.78E-08	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.26E-06	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	9.62E-07	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	1.42E-10	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.66E-09	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	7.24E-12	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Aldrin	4.29E-11	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.65E-04	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.11E-08	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.26E-07	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	4.91E-06	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	9.96E-09	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Boron	2.09E-07	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.04E-07	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	1.08E-06	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.52E-07	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	1.03E-06	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	9.27E-08	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.52E-03	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.72E-07	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	3.10E-05	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.45E-09	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	7.77E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	3.14E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	8.77E-08	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	3.51E-08	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	5.32E-09	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.17E-06	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	5.18E-08	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	3.68E-06	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.81E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	4.15E-10	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	7.77E-09	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	2.11E-11	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Aldrin	1.25E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.09E-07	=	[	1.0E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.22E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	3.57E-10	=	[	7.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	5.38E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.09E-11	=	[	2.2E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Boron	2.29E-10	=	[	4.6E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	2.24E-10	=	[	4.5E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	1.18E-09	=	[	2.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	6.05E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	1.13E-09	=	[	2.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.02E-10	=	[	2.0E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.66E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	6.27E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	3.40E-08	=	[	6.8E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	1.59E-12	=	[	3.2E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	8.51E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	3.45E-10	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	9.61E-11	=	[	1.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Selenium	3.84E-11	=	[	7.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	5.83E-12	=	[	1.2E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.38E-09	=	[	4.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	5.68E-11	=	[	1.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.04E-09	=	[	8.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.07E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Acetone	4.55E-13	=	[	9.1E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	8.51E-12	=	[	1.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	2.31E-14	=	[	4.6E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Aldrin	1.37E-13	=	[	2.7E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.49E-06	=	[	1.0E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	3.56E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.04E-09	=	[	7.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.57E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	3.18E-11	=	[	2.2E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Boron	6.69E-10	=	[	4.6E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	6.53E-10	=	[	4.5E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	3.44E-09	=	[	2.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.77E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	3.30E-09	=	[	2.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	2.96E-10	=	[	2.0E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.84E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.83E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	9.91E-08	=	[	6.8E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	4.64E-12	=	[	3.2E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.48E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.00E-09	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	2.80E-10	=	[	1.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Selenium	1.12E-10	=	[	7.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.70E-11	=	[	1.2E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	6.95E-09	=	[	4.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.66E-10	=	[	1.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.18E-08	=	[	8.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	8.97E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Acetone	1.33E-12	=	[	9.1E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	2.48E-11	=	[	1.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	6.75E-14	=	[	4.6E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Aldrin	4.00E-13	=	[	2.7E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.34E-08	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.79E-10	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.06E-09	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Aldrin	1.71E-11	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.90E-08	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	8.15E-10	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	3.10E-09	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Aldrin	5.00E-11	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.59E-04	x	0.00E+00	=	0.00E+00	4.65E-04	/	1.00E+00	=	4.65E-04
Antimony	3.82E-09	x	0.00E+00	=	0.00E+00	1.11E-08	/	4.00E-04	=	2.79E-05
Arsenic	1.12E-07	x	1.50E+00	=	1.67E-07	3.26E-07	/	3.00E-04	=	1.09E-03
Barium	1.68E-06	x	0.00E+00	=	0.00E+00	4.91E-06	/	2.00E-01	=	2.45E-05
Beryllium	3.41E-09	x	0.00E+00	=	0.00E+00	9.96E-09	/	2.00E-03	=	4.98E-06
Boron	7.17E-08	x	0.00E+00	=	0.00E+00	2.09E-07	/	2.00E-01	=	1.05E-06
Cadmium	7.00E-08	x	0.00E+00	=	0.00E+00	2.04E-07	/	1.00E-03	=	2.04E-04
Chromium	3.69E-07	x	0.00E+00	=	0.00E+00	1.08E-06	/	3.00E-03	=	3.59E-04
Cobalt	1.89E-07	x	0.00E+00	=	0.00E+00	5.52E-07	/	3.00E-04	=	1.84E-03
Copper	3.54E-07	x	0.00E+00	=	0.00E+00	1.03E-06	/	4.00E-02	=	2.58E-05
Fluoride	3.18E-08	x	0.00E+00	=	0.00E+00	9.27E-08	/	4.00E-02	=	2.32E-06
Iron	5.20E-04	x	0.00E+00	=	0.00E+00	1.52E-03	/	7.00E-01	=	2.16E-03
Lithium	1.96E-07	x	0.00E+00	=	0.00E+00	5.72E-07	/	2.00E-03	=	2.86E-04
Manganese	1.06E-05	x	0.00E+00	=	0.00E+00	3.10E-05	/	1.40E-01	=	2.21E-04
Mercury	4.98E-10	x	0.00E+00	=	0.00E+00	1.45E-09	/	0.00E+00	=	NA
Nickel	2.66E-07	x	0.00E+00	=	0.00E+00	7.77E-07	/	2.00E-02	=	3.88E-05
Nitrate	1.08E-07	x	0.00E+00	=	0.00E+00	3.14E-07	/	1.60E+00	=	1.96E-07
Nitrite	3.01E-08	x	0.00E+00	=	0.00E+00	8.77E-08	/	1.00E-01	=	8.77E-07
Selenium	1.20E-08	x	0.00E+00	=	0.00E+00	3.51E-08	/	5.00E-03	=	7.01E-06
Silver	1.82E-09	x	0.00E+00	=	0.00E+00	5.32E-09	/	5.00E-03	=	1.06E-06
Strontium	7.45E-07	x	0.00E+00	=	0.00E+00	2.17E-06	/	6.00E-01	=	3.62E-06
Total Uranium	1.78E-08	x	0.00E+00	=	0.00E+00	5.18E-08	/	3.00E-03	=	1.73E-05
Vanadium	1.26E-06	x	0.00E+00	=	0.00E+00	3.68E-06	/	5.00E-03	=	7.36E-04
Zinc	9.62E-07	x	0.00E+00	=	0.00E+00	2.81E-06	/	3.00E-01	=	9.35E-06
Acetone	1.42E-10	x	0.00E+00	=	0.00E+00	4.15E-10	/	9.00E-01	=	4.61E-10
Butylbenzylphthalate	2.66E-09	x	1.90E-03	=	5.06E-12	7.77E-09	/	2.00E-01	=	3.88E-08
Toluene	7.24E-12	x	0.00E+00	=	0.00E+00	2.11E-11	/	8.00E-02	=	2.64E-10
Aldrin	4.29E-11	x	1.70E+01	=	7.30E-10	1.25E-10	/	3.00E-05	=	4.17E-06
			Pathway total	=	1.68E-07			Pathway total	=	7.53E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	5.09E-07	x		=	NA	1.49E-06	/[	5.00E-03	x	1000	]=	2.97E-07
Antimony	1.22E-11	x		=	NA	3.56E-11	/[		x	1000	]=	NA
Arsenic	3.57E-10	x	4.30E-03	=	1.53E-12	1.04E-09	/[	1.50E-05	x	1000	]=	6.94E-08
Barium	5.38E-09	x		=	NA	1.57E-08	/[	5.00E-04	x	1000	]=	3.14E-08
Beryllium	1.09E-11	x	2.40E-03	=	2.62E-14	3.18E-11	/[	2.00E-05	x	1000	]=	1.59E-09
Boron	2.29E-10	x	0.00E+00	=	0.00E+00	6.69E-10	/[	2.00E-02	x	1000	]=	3.34E-11
Cadmium	2.24E-10	x	1.80E-03	=	4.03E-13	6.53E-10	/[	1.00E-05	x	1000	]=	6.53E-08
Chromium	1.18E-09	x	8.40E-02	=	9.92E-11	3.44E-09	/[	1.00E-04	x	1000	]=	3.44E-08
Cobalt	6.05E-10	x	9.00E-03	=	5.45E-12	1.77E-09	/[	6.00E-06	x	1000	]=	2.94E-07
Copper	1.13E-09	x		=	NA	3.30E-09	/[		x	1000	]=	NA
Fluoride	1.02E-10	x		=	NA	2.96E-10	/[	1.30E-02	x	1000	]=	2.28E-11
Iron	1.66E-06	x		=	NA	4.84E-06	/[		x	1000	]=	NA
Lithium	6.27E-10	x		=	NA	1.83E-09	/[		x	1000	]=	NA
Manganese	3.40E-08	x		=	NA	9.91E-08	/[	5.00E-05	x	1000	]=	1.98E-06
Mercury	1.59E-12	x	0.00E+00	=	0.00E+00	4.64E-12	/[	3.00E-04	x	1000	]=	1.55E-11
Nickel	8.51E-10	x	2.60E-04	=	2.21E-13	2.48E-09	/[	9.00E-05	x	1000	]=	2.76E-08
Nitrate	3.45E-10	x		=	NA	1.00E-09	/[		x	1000	]=	NA
Nitrite	9.61E-11	x		=	NA	2.80E-10	/[		x	1000	]=	NA
Selenium	3.84E-11	x	0.00E+00	=	0.00E+00	1.12E-10	/[	2.00E-02	x	1000	]=	5.60E-12
Silver	5.83E-12	x		=	NA	1.70E-11	/[		x	1000	]=	NA
Strontium	2.38E-09	x		=	NA	6.95E-09	/[		x	1000	]=	NA
Total Uranium	5.68E-11	x		=	NA	1.66E-10	/[	4.00E-05	x	1000	]=	4.14E-09
Vanadium	4.04E-09	x		=	NA	1.18E-08	/[	1.00E-04	x	1000	]=	1.18E-07
Zinc	3.07E-09	x		=	NA	8.97E-09	/[		x	1000	]=	NA
Acetone	4.55E-13	x	0.00E+00	=	0.00E+00	1.33E-12	/[	3.10E+01	x	1000	]=	4.28E-17
Butylbenzylphthalate	8.51E-12	x	0.00E+00	=	0.00E+00	2.48E-11	/[		x	1000	]=	NA
Toluene	2.31E-14	x	0.00E+00	=	0.00E+00	6.75E-14	/[	5.00E+00	x	1000	]=	1.35E-17
Aldrin	1.37E-13	x	4.90E-03	=	6.73E-16	4.00E-13	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.07E-10					Pathway total =		2.92E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.34E-08	x	1.50E+00	=	2.00E-08	3.90E-08	/	3.00E-04	=	1.30E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	2.79E-10	x		=	NA	8.15E-10	/	2.50E-05	=	3.26E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.06E-09	x	1.90E-03	=	2.02E-12	3.10E-09	/	2.00E-01	=	1.55E-08
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	1.71E-11	x	1.70E+01	=	2.91E-10	5.00E-11	/	3.00E-05	=	1.67E-06
			Pathway total =		2.03E-08			Pathway total =		1.64E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Arsenic	Sum of all pathways	=	1.88E-07	Sum of all pathways	=	1.2E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Beryllium	Sum of all pathways	=	2.62E-14	Sum of all pathways	=	5.0E-06
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-06
Cadmium	Sum of all pathways	=	4.03E-13	Sum of all pathways	=	2.4E-04
Chromium	Sum of all pathways	=	9.92E-11	Sum of all pathways	=	3.6E-04
Cobalt	Sum of all pathways	=	5.45E-12	Sum of all pathways	=	1.8E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-11
Nickel	Sum of all pathways	=	2.21E-13	Sum of all pathways	=	3.9E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-07
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-06
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-10
Butylbenzylphthalate	Sum of all pathways	=	7.08E-12	Sum of all pathways	=	5.4E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-10
Aldrin	Sum of all pathways	=	1.02E-09	Sum of all pathways	=	5.8E-06

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.89E-07	All Pathways and Chemicals	=	7.70E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.45E-04	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.31E-09	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	7.49E-08	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	2.02E-06	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	6.40E-09	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.50E-09	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	1.93E-07	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.76E-07	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.80E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	4.53E-08	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.14E-04	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.59E-07	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	8.29E-06	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	6.53E-10	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.42E-07	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.54E-07	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	6.57E-08	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.76E-09	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	7.77E-07	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Tin	1.37E-07	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.54E-08	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.50E-06	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	8.23E-07	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
2-Butanone	5.34E-11	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	8.66E-08	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.27E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Hexane	7.71E-10	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	4.29E-11	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
o-Xylene	2.75E-12	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	1.40E-11	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	2.10E-11	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Xylenes (total)	9.94E-12	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	5.42E-10	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.09E-10	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1260	4.42E-10	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.23E-04	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.55E-08	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.18E-07	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	5.89E-06	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.87E-08	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	7.30E-09	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	5.62E-07	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.12E-07	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	8.16E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.32E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.50E-03	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	4.65E-07	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.42E-05	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.90E-09	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	7.05E-07	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	4.48E-07	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	1.92E-07	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	5.12E-09	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.27E-06	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Tin	3.98E-07	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	4.48E-08	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	4.37E-06	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.40E-06	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
2-Butanone	1.56E-10	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	2.53E-07	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	3.71E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Hexane	2.25E-09	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	1.25E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
o-Xylene	8.02E-12	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	4.10E-11	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	6.12E-11	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Xylenes (total)	2.90E-11	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	1.58E-09	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Gamma-BHC (Lindane)	3.19E-10	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1260	1.29E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.64E-07	=	[	9.3E-05	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.70E-11	=	[	3.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	2.39E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	6.46E-09	=	[	1.3E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	2.05E-11	=	[	4.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	8.00E-12	=	[	1.6E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	6.16E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	5.62E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	8.94E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.45E-10	=	[	2.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.64E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	5.10E-10	=	[	1.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.65E-08	=	[	5.3E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	2.09E-12	=	[	4.2E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	7.72E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	4.91E-10	=	[	9.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	2.10E-10	=	[	4.2E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	5.61E-12	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.48E-09	=	[	5.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Tin	4.36E-10	=	[	8.7E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	4.91E-11	=	[	9.8E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.79E-09	=	[	9.6E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	2.63E-09	=	[	5.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
2-Butanone	1.71E-13	=	[	3.4E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.77E-10	=	[	5.5E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.06E-12	=	[	8.1E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Hexane	2.46E-12	=	[	4.9E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Methylene chloride	1.37E-13	=	[	2.7E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
o-Xylene	8.78E-15	=	[	1.8E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Styrene	4.49E-14	=	[	9.0E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	6.71E-14	=	[	1.3E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Xylenes (total)	3.18E-14	=	[	6.3E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
beta-BHC	1.73E-12	=	[	3.5E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	3.50E-13	=	[	7.0E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Aroclor-1260	1.41E-12	=	[	2.8E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.35E-06	=	[	9.3E-05	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	4.95E-11	=	[	3.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	6.98E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.88E-08	=	[	1.3E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	5.96E-11	=	[	4.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	2.33E-11	=	[	1.6E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	1.80E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.64E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.61E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	4.23E-10	=	[	2.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.79E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.49E-09	=	[	1.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.73E-08	=	[	5.3E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	6.08E-12	=	[	4.2E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.25E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.43E-09	=	[	9.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	6.12E-10	=	[	4.2E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.64E-11	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	7.24E-09	=	[	5.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Tin	1.27E-09	=	[	8.7E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.43E-10	=	[	9.8E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.40E-08	=	[	9.6E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	7.67E-09	=	[	5.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
2-Butanone	4.97E-13	=	[	3.4E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Bis(2-ethylhexyl) phthalate	8.07E-10	=	[	5.5E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	1.19E-11	=	[	8.1E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Hexane	7.19E-12	=	[	4.9E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Methylene chloride	4.00E-13	=	[	2.7E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
o-Xylene	2.56E-14	=	[	1.8E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Styrene	1.31E-13	=	[	9.0E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	1.96E-13	=	[	1.3E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Xylenes (total)	9.27E-14	=	[	6.3E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
beta-BHC	5.05E-12	=	[	3.5E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Gamma-BHC (Lindane)	1.02E-12	=	[	7.0E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Aroclor-1260	4.12E-12	=	[	2.8E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	8.96E-09	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	9.98E-12	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.45E-08	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.07E-10	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	2.16E-10	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.75E-11	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1260	2.47E-10	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.61E-08	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.91E-11	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	1.01E-07	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	1.48E-09	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	6.31E-10	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Gamma-BHC (Lindane)	5.10E-11	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1260	7.21E-10	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.45E-04	x	0.00E+00	=	0.00E+00	4.23E-04	/	1.00E+00	=	4.23E-04
Antimony	5.31E-09	x	0.00E+00	=	0.00E+00	1.55E-08	/	4.00E-04	=	3.87E-05
Arsenic	7.49E-08	x	1.50E+00	=	1.12E-07	2.18E-07	/	3.00E-04	=	7.28E-04
Barium	2.02E-06	x	0.00E+00	=	0.00E+00	5.89E-06	/	2.00E-01	=	2.95E-05
Beryllium	6.40E-09	x	0.00E+00	=	0.00E+00	1.87E-08	/	2.00E-03	=	9.33E-06
Cadmium	2.50E-09	x	0.00E+00	=	0.00E+00	7.30E-09	/	1.00E-03	=	7.30E-06
Chromium	1.93E-07	x	0.00E+00	=	0.00E+00	5.62E-07	/	3.00E-03	=	1.87E-04
Cobalt	1.76E-07	x	0.00E+00	=	0.00E+00	5.12E-07	/	3.00E-04	=	1.71E-03
Copper	2.80E-07	x	0.00E+00	=	0.00E+00	8.16E-07	/	4.00E-02	=	2.04E-05
Fluoride	4.53E-08	x	0.00E+00	=	0.00E+00	1.32E-07	/	4.00E-02	=	3.31E-06
Iron	5.14E-04	x	0.00E+00	=	0.00E+00	1.50E-03	/	7.00E-01	=	2.14E-03
Lithium	1.59E-07	x	0.00E+00	=	0.00E+00	4.65E-07	/	2.00E-03	=	2.33E-04
Manganese	8.29E-06	x	0.00E+00	=	0.00E+00	2.42E-05	/	1.40E-01	=	1.73E-04
Mercury	6.53E-10	x	0.00E+00	=	0.00E+00	1.90E-09	/	0.00E+00	=	NA
Nickel	2.42E-07	x	0.00E+00	=	0.00E+00	7.05E-07	/	2.00E-02	=	3.52E-05
Nitrate	1.54E-07	x	0.00E+00	=	0.00E+00	4.48E-07	/	1.60E+00	=	2.80E-07
Nitrite	6.57E-08	x	0.00E+00	=	0.00E+00	1.92E-07	/	1.00E-01	=	1.92E-06
Silver	1.76E-09	x	0.00E+00	=	0.00E+00	5.12E-09	/	5.00E-03	=	1.02E-06
Strontium	7.77E-07	x	0.00E+00	=	0.00E+00	2.27E-06	/	6.00E-01	=	3.78E-06
Tin	1.37E-07	x	0.00E+00	=	0.00E+00	3.98E-07	/	6.00E-01	=	6.64E-07
Total Uranium	1.54E-08	x	0.00E+00	=	0.00E+00	4.48E-08	/	3.00E-03	=	1.49E-05
Vanadium	1.50E-06	x	0.00E+00	=	0.00E+00	4.37E-06	/	5.00E-03	=	8.73E-04
Zinc	8.23E-07	x	0.00E+00	=	0.00E+00	2.40E-06	/	3.00E-01	=	8.00E-06
2-Butanone	5.34E-11	x	0.00E+00	=	0.00E+00	1.56E-10	/	6.00E-01	=	2.59E-10
Bis(2-ethylhexyl) phthalate	8.66E-08	x	1.40E-02	=	1.21E-09	2.53E-07	/	2.00E-02	=	1.26E-05
Butylbenzylphthalate	1.27E-09	x	1.90E-03	=	2.42E-12	3.71E-09	/	2.00E-01	=	1.85E-08
Hexane	7.71E-10	x	0.00E+00	=	0.00E+00	2.25E-09	/	6.00E-02	=	3.75E-08
Methylene chloride	4.29E-11	x	2.00E-03	=	8.59E-14	1.25E-10	/	6.00E-03	=	2.09E-08
o-Xylene	2.75E-12	x	0.00E+00	=	0.00E+00	8.02E-12	/	2.00E-01	=	4.01E-11
Styrene	1.40E-11	x	0.00E+00	=	0.00E+00	4.10E-11	/	2.00E-01	=	2.05E-10
Toluene	2.10E-11	x	0.00E+00	=	0.00E+00	6.12E-11	/	8.00E-02	=	7.66E-10
Xylenes (total)	9.94E-12	x	0.00E+00	=	0.00E+00	2.90E-11	/	2.00E-01	=	1.45E-10
beta-BHC	5.42E-10	x	1.80E+00	=	9.75E-10	1.58E-09	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	1.09E-10	x	1.10E+00	=	1.20E-10	3.19E-10	/	3.00E-04	=	1.06E-06
Aroclor-1260	4.42E-10	x	2.00E+00	=	8.85E-10	1.29E-09	/	0.00E+00	=	NA
			Pathway total	=	1.16E-07			Pathway total	=	6.66E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	4.64E-07	x		=	NA	1.35E-06	/[	5.00E-03	x	1000	]=	2.71E-07
Antimony	1.70E-11	x		=	NA	4.95E-11	/[		x	1000	]=	NA
Arsenic	2.39E-10	x	4.30E-03	=	1.03E-12	6.98E-10	/[	1.50E-05	x	1000	]=	4.65E-08
Barium	6.46E-09	x		=	NA	1.88E-08	/[	5.00E-04	x	1000	]=	3.77E-08
Beryllium	2.05E-11	x	2.40E-03	=	4.91E-14	5.96E-11	/[	2.00E-05	x	1000	]=	2.98E-09
Cadmium	8.00E-12	x	1.80E-03	=	1.44E-14	2.33E-11	/[	1.00E-05	x	1000	]=	2.33E-09
Chromium	6.16E-10	x	8.40E-02	=	5.17E-11	1.80E-09	/[	1.00E-04	x	1000	]=	1.80E-08
Cobalt	5.62E-10	x	9.00E-03	=	5.05E-12	1.64E-09	/[	6.00E-06	x	1000	]=	2.73E-07
Copper	8.94E-10	x		=	NA	2.61E-09	/[		x	1000	]=	NA
Fluoride	1.45E-10	x		=	NA	4.23E-10	/[	1.30E-02	x	1000	]=	3.25E-11
Iron	1.64E-06	x		=	NA	4.79E-06	/[		x	1000	]=	NA
Lithium	5.10E-10	x		=	NA	1.49E-09	/[		x	1000	]=	NA
Manganese	2.65E-08	x		=	NA	7.73E-08	/[	5.00E-05	x	1000	]=	1.55E-06
Mercury	2.09E-12	x	0.00E+00	=	0.00E+00	6.08E-12	/[	3.00E-04	x	1000	]=	2.03E-11
Nickel	7.72E-10	x	2.60E-04	=	2.01E-13	2.25E-09	/[	9.00E-05	x	1000	]=	2.50E-08
Nitrate	4.91E-10	x		=	NA	1.43E-09	/[		x	1000	]=	NA
Nitrite	2.10E-10	x		=	NA	6.12E-10	/[		x	1000	]=	NA
Silver	5.61E-12	x		=	NA	1.64E-11	/[		x	1000	]=	NA
Strontium	2.48E-09	x		=	NA	7.24E-09	/[		x	1000	]=	NA
Tin	4.36E-10	x		=	NA	1.27E-09	/[		x	1000	]=	NA
Total Uranium	4.91E-11	x		=	NA	1.43E-10	/[	4.00E-05	x	1000	]=	3.58E-09
Vanadium	4.79E-09	x		=	NA	1.40E-08	/[	1.00E-04	x	1000	]=	1.40E-07
Zinc	2.63E-09	x		=	NA	7.67E-09	/[		x	1000	]=	NA
2-Butanone	1.71E-13	x	0.00E+00	=	0.00E+00	4.97E-13	/[	5.00E+00	x	1000	]=	9.95E-17
Bis(2-ethylhexyl) phthalate	2.77E-10	x	2.40E-06	=	6.64E-16	8.07E-10	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	4.06E-12	x	0.00E+00	=	0.00E+00	1.19E-11	/[		x	1000	]=	NA
Hexane	2.46E-12	x	0.00E+00	=	0.00E+00	7.19E-12	/[	7.00E-01	x	1000	]=	1.03E-14
Methylene chloride	1.37E-13	x	1.00E-08	=	1.37E-21	4.00E-13	/[	6.00E-01	x	1000	]=	6.67E-16
o-Xylene	8.78E-15	x	0.00E+00	=	0.00E+00	2.56E-14	/[	1.00E-01	x	1000	]=	2.56E-16
Styrene	4.49E-14	x	0.00E+00	=	0.00E+00	1.31E-13	/[	1.00E+00	x	1000	]=	1.31E-16
Toluene	6.71E-14	x	0.00E+00	=	0.00E+00	1.96E-13	/[	5.00E+00	x	1000	]=	3.92E-17
Xylenes (total)	3.18E-14	x	0.00E+00	=	0.00E+00	9.27E-14	/[	1.00E-01	x	1000	]=	9.27E-16
beta-BHC	1.73E-12	x	5.30E-04	=	9.18E-16	5.05E-12	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	3.50E-13	x	3.10E-04	=	1.08E-16	1.02E-12	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.41E-12	x	5.70E-04	=	8.06E-16	4.12E-12	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		5.81E-11					Pathway total =		2.37E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	8.96E-09	x	1.50E+00	=	1.34E-08	2.61E-08	/	3.00E-04	=	8.71E-05
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	9.98E-12	x		=	NA	2.91E-11	/	2.50E-05	=	1.16E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	3.45E-08	x	1.40E-02	=	4.84E-10	1.01E-07	/	2.00E-02	=	5.04E-06
Butylbenzylphthalate	5.07E-10	x	1.90E-03	=	9.64E-13	1.48E-09	/	2.00E-01	=	7.40E-09
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	2.16E-10	x	1.80E+00	=	3.89E-10	6.31E-10	/		=	NA
Gamma-BHC (Lindane)	1.75E-11	x	1.10E+00	=	1.92E-11	5.10E-11	/	3.00E-04	=	1.70E-07
Aroclor-1260	2.47E-10	x	2.00E+00	=	4.94E-10	7.21E-10	/		=	NA
			Pathway total =		1.48E-08			Pathway total =		9.35E-05

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-05
Arsenic	Sum of all pathways	=	1.26E-07	Sum of all pathways	=	8.2E-04
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Beryllium	Sum of all pathways	=	4.91E-14	Sum of all pathways	=	9.3E-06
Cadmium	Sum of all pathways	=	1.44E-14	Sum of all pathways	=	8.5E-06
Chromium	Sum of all pathways	=	5.17E-11	Sum of all pathways	=	1.9E-04
Cobalt	Sum of all pathways	=	5.05E-12	Sum of all pathways	=	1.7E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-11
Nickel	Sum of all pathways	=	2.01E-13	Sum of all pathways	=	3.5E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-06
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-07
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-06
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-10
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.70E-09	Sum of all pathways	=	1.8E-05
Butylbenzylphthalate	Sum of all pathways	=	3.38E-12	Sum of all pathways	=	2.6E-08
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-08
Methylene chloride	Sum of all pathways	=	8.59E-14	Sum of all pathways	=	2.1E-08
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-11
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-10
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-10
beta-BHC	Sum of all pathways	=	1.36E-09	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	1.40E-10	Sum of all pathways	=	1.2E-06
Aroclor-1260	Sum of all pathways	=	1.38E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.30E-07	All Pathways and Chemicals	=	6.75E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.50E-04	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.49E-09	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.08E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.94E-06	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	4.27E-09	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.95E-09	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	3.61E-07	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	2.19E-07	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.62E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	3.56E-08	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.60E-04	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.62E-07	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	8.76E-06	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	4.29E-08	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.81E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	6.97E-07	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	2.79E-08	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	2.11E-08	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.41E-09	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	7.17E-07	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.17E-08	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.42E-06	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	9.62E-07	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.29E-09	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.22E-08	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	8.46E-12	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	1.33E-11	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.39E-04	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.60E-08	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.14E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	5.67E-06	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.24E-08	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	8.61E-09	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	1.05E-06	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	6.38E-07	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	7.64E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.04E-07	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.63E-03	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	4.74E-07	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.56E-05	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	1.25E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	8.19E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	2.03E-06	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	8.14E-08	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	6.15E-08	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	4.10E-09	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.09E-06	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	3.42E-08	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	4.14E-06	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.80E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	1.25E-08	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Di-n-butylphthalate	3.57E-08	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	2.47E-11	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	3.87E-11	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.81E-07	=	[	9.6E-05	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.76E-11	=	[	3.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	3.44E-10	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	6.21E-09	=	[	1.2E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.36E-11	=	[	2.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	9.43E-12	=	[	1.9E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	1.15E-09	=	[	2.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	6.99E-10	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	8.37E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.14E-10	=	[	2.3E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.79E-06	=	[	3.6E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	5.19E-10	=	[	1.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.80E-08	=	[	5.6E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Molybdenum	1.37E-10	=	[	2.7E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	8.98E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	2.23E-09	=	[	4.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	8.92E-11	=	[	1.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Selenium	6.74E-11	=	[	1.3E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	4.49E-12	=	[	9.0E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.29E-09	=	[	4.6E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	3.74E-11	=	[	7.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.54E-09	=	[	9.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.07E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.37E-11	=	[	2.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	3.91E-11	=	[	7.8E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Styrene	2.70E-14	=	[	5.4E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	4.24E-14	=	[	8.5E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.40E-06	=	[	9.6E-05	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	5.12E-11	=	[	3.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.00E-09	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.81E-08	=	[	1.2E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	3.98E-11	=	[	2.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	2.75E-11	=	[	1.9E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	3.36E-09	=	[	2.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	2.04E-09	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.44E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	3.32E-10	=	[	2.3E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	5.22E-06	=	[	3.6E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.51E-09	=	[	1.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	8.17E-08	=	[	5.6E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Molybdenum	4.00E-10	=	[	2.7E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.62E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	6.49E-09	=	[	4.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	2.60E-10	=	[	1.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Selenium	1.97E-10	=	[	1.3E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.31E-11	=	[	9.0E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	6.68E-09	=	[	4.6E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.09E-10	=	[	7.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.32E-08	=	[	9.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	8.96E-09	=	[	6.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	4.00E-11	=	[	2.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Di-n-butylphthalate	1.14E-10	=	[	7.8E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Styrene	7.88E-14	=	[	5.4E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	1.24E-13	=	[	8.5E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.29E-08	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	1.18E-11	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.71E-09	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Di-n-butylphthalate	4.88E-09	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.76E-08	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	3.43E-11	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	5.00E-09	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Di-n-butylphthalate	1.42E-08	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.50E-04	x	0.00E+00	=	0.00E+00	4.39E-04	/	1.00E+00	=	4.39E-04
Antimony	5.49E-09	x	0.00E+00	=	0.00E+00	1.60E-08	/	4.00E-04	=	4.01E-05
Arsenic	1.08E-07	x	1.50E+00	=	1.62E-07	3.14E-07	/	3.00E-04	=	1.05E-03
Barium	1.94E-06	x	0.00E+00	=	0.00E+00	5.67E-06	/	2.00E-01	=	2.83E-05
Beryllium	4.27E-09	x	0.00E+00	=	0.00E+00	1.24E-08	/	2.00E-03	=	6.22E-06
Cadmium	2.95E-09	x	0.00E+00	=	0.00E+00	8.61E-09	/	1.00E-03	=	8.61E-06
Chromium	3.61E-07	x	0.00E+00	=	0.00E+00	1.05E-06	/	3.00E-03	=	3.51E-04
Cobalt	2.19E-07	x	0.00E+00	=	0.00E+00	6.38E-07	/	3.00E-04	=	2.13E-03
Copper	2.62E-07	x	0.00E+00	=	0.00E+00	7.64E-07	/	4.00E-02	=	1.91E-05
Fluoride	3.56E-08	x	0.00E+00	=	0.00E+00	1.04E-07	/	4.00E-02	=	2.59E-06
Iron	5.60E-04	x	0.00E+00	=	0.00E+00	1.63E-03	/	7.00E-01	=	2.33E-03
Lithium	1.62E-07	x	0.00E+00	=	0.00E+00	4.74E-07	/	2.00E-03	=	2.37E-04
Manganese	8.76E-06	x	0.00E+00	=	0.00E+00	2.56E-05	/	1.40E-01	=	1.83E-04
Molybdenum	4.29E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	5.00E-03	=	2.50E-05
Nickel	2.81E-07	x	0.00E+00	=	0.00E+00	8.19E-07	/	2.00E-02	=	4.10E-05
Nitrate	6.97E-07	x	0.00E+00	=	0.00E+00	2.03E-06	/	1.60E+00	=	1.27E-06
Nitrite	2.79E-08	x	0.00E+00	=	0.00E+00	8.14E-08	/	1.00E-01	=	8.14E-07
Selenium	2.11E-08	x	0.00E+00	=	0.00E+00	6.15E-08	/	5.00E-03	=	1.23E-05
Silver	1.41E-09	x	0.00E+00	=	0.00E+00	4.10E-09	/	5.00E-03	=	8.20E-07
Strontium	7.17E-07	x	0.00E+00	=	0.00E+00	2.09E-06	/	6.00E-01	=	3.49E-06
Total Uranium	1.17E-08	x	0.00E+00	=	0.00E+00	3.42E-08	/	3.00E-03	=	1.14E-05
Vanadium	1.42E-06	x	0.00E+00	=	0.00E+00	4.14E-06	/	5.00E-03	=	8.28E-04
Zinc	9.62E-07	x	0.00E+00	=	0.00E+00	2.80E-06	/	3.00E-01	=	9.35E-06
Butylbenzylphthalate	4.29E-09	x	1.90E-03	=	8.16E-12	1.25E-08	/	2.00E-01	=	6.26E-08
Di-n-butylphthalate	1.22E-08	x	0.00E+00	=	0.00E+00	3.57E-08	/	1.00E-01	=	3.57E-07
Styrene	8.46E-12	x	0.00E+00	=	0.00E+00	2.47E-11	/	2.00E-01	=	1.23E-10
Toluene	1.33E-11	x	0.00E+00	=	0.00E+00	3.87E-11	/	8.00E-02	=	4.84E-10
			Pathway total	=	1.62E-07			Pathway total	=	7.75E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	4.81E-07	x		=	NA	1.40E-06	/[	5.00E-03	x	1000	]=	2.80E-07
Antimony	1.76E-11	x		=	NA	5.12E-11	/[		x	1000	]=	NA
Arsenic	3.44E-10	x	4.30E-03	=	1.48E-12	1.00E-09	/[	1.50E-05	x	1000	]=	6.70E-08
Barium	6.21E-09	x		=	NA	1.81E-08	/[	5.00E-04	x	1000	]=	3.62E-08
Beryllium	1.36E-11	x	2.40E-03	=	3.27E-14	3.98E-11	/[	2.00E-05	x	1001	]=	1.99E-09
Cadmium	9.43E-12	x	1.80E-03	=	1.70E-14	2.75E-11	/[	1.00E-05	x	1002	]=	2.75E-09
Chromium	1.15E-09	x	8.40E-02	=	9.68E-11	3.36E-09	/[	1.00E-04	x	1003	]=	3.35E-08
Cobalt	6.99E-10	x	9.00E-03	=	6.29E-12	2.04E-09	/[	6.00E-06	x	1004	]=	3.38E-07
Copper	8.37E-10	x		=	NA	2.44E-09	/[		x	1005	]=	NA
Fluoride	1.14E-10	x		=	NA	3.32E-10	/[	1.30E-02	x	1000	]=	2.55E-11
Iron	1.79E-06	x		=	NA	5.22E-06	/[		x	1000	]=	NA
Lithium	5.19E-10	x		=	NA	1.51E-09	/[		x	1000	]=	NA
Manganese	2.80E-08	x		=	NA	8.17E-08	/[	5.00E-05	x	1000	]=	1.63E-06
Molybdenum	1.37E-10	x	0.00E+00	=	0.00E+00	4.00E-10	/[	0.00E+00	x	1000	]=	NA
Nickel	8.98E-10	x	2.60E-04	=	2.33E-13	2.62E-09	/[	9.00E-05	x	1000	]=	2.91E-08
Nitrate	2.23E-09	x		=	NA	6.49E-09	/[		x	1000	]=	NA
Nitrite	8.92E-11	x		=	NA	2.60E-10	/[		x	1000	]=	NA
Selenium	6.74E-11	x	0.00E+00	=	0.00E+00	1.97E-10	/[	2.00E-02	x	1000	]=	9.83E-12
Silver	4.49E-12	x		=	NA	1.31E-11	/[		x	1000	]=	NA
Strontium	2.29E-09	x		=	NA	6.68E-09	/[		x	1000	]=	NA
Total Uranium	3.74E-11	x		=	NA	1.09E-10	/[	4.00E-05	x	1000	]=	2.73E-09
Vanadium	4.54E-09	x		=	NA	1.32E-08	/[	1.00E-04	x	1000	]=	1.32E-07
Zinc	3.07E-09	x		=	NA	8.96E-09	/[		x	1000	]=	NA
Butylbenzylphthalate	1.37E-11	x	0.00E+00	=	0.00E+00	4.00E-11	/[		x	1000	]=	NA
Di-n-butylphthalate	3.91E-11	x	0.00E+00	=	0.00E+00	1.14E-10	/[	0.00E+00	x	1000	]=	NA
Styrene	2.70E-14	x	0.00E+00	=	0.00E+00	7.88E-14	/[	1.00E+00	x	1000	]=	7.88E-17
Toluene	4.24E-14	x	0.00E+00	=	0.00E+00	1.24E-13	/	5.00E+00	x	1000	]=	2.47E-17
			Pathway total =		1.05E-10					Pathway total =		2.56E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.29E-08	x	1.50E+00	=	1.94E-08	3.76E-08	/	3.00E-04	=	1.25E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.18E-11	x		=	NA	3.43E-11	/	2.50E-05	=	1.37E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.71E-09	x	1.90E-03	=	3.26E-12	5.00E-09	/	2.00E-01	=	2.50E-08
Di-n-butylphthalate	4.88E-09	x		=	NA	1.42E-08	/	1.00E-01	=	1.42E-07
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.94E-08			Pathway total =		1.27E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-05
Arsenic	Sum of all pathways	=	1.81E-07	Sum of all pathways	=	1.2E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Beryllium	Sum of all pathways	=	3.27E-14	Sum of all pathways	=	6.2E-06
Cadmium	Sum of all pathways	=	1.70E-14	Sum of all pathways	=	1.0E-05
Chromium	Sum of all pathways	=	9.68E-11	Sum of all pathways	=	3.5E-04
Cobalt	Sum of all pathways	=	6.29E-12	Sum of all pathways	=	2.1E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Nickel	Sum of all pathways	=	2.33E-13	Sum of all pathways	=	4.1E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-07
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-07
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-06
Butylbenzylphthalate	Sum of all pathways	=	1.14E-11	Sum of all pathways	=	8.8E-08
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-07
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-10

Total Carcinogenic Risk		
All Pathways and Chemicals	=	1.81E-07

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	7.88E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.66E-04	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	4.64E-08	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.69E-07	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	5.24E-06	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	7.04E-09	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Boron	9.43E-07	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.43E-09	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.49E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.78E-07	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.96E-07	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	3.28E-08	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.17E-04	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.86E-07	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	8.22E-06	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	3.48E-10	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.94E-07	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.98E-07	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	5.37E-08	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.34E-09	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	2.68E-06	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Tin	7.73E-08	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.40E-08	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.17E-06	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	1.12E-06	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.44E-08	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.67E-09	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.85E-04	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.35E-07	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	4.94E-07	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	1.53E-05	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	2.05E-08	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Boron	2.75E-06	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	7.08E-09	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	7.26E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.18E-07	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	8.64E-07	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	9.58E-08	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.51E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.44E-07	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.40E-05	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.01E-09	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	8.58E-07	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	5.78E-07	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	1.57E-07	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	3.91E-09	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	7.83E-06	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Tin	2.25E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	4.07E-08	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	3.40E-06	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	3.28E-06	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	1.30E-07	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	4.87E-09	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.31E-07	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.48E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	5.41E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	1.67E-08	=	[	3.3E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	2.25E-11	=	[	4.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Boron	3.01E-09	=	[	6.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	7.75E-12	=	[	1.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	7.96E-10	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	5.68E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	9.47E-10	=	[	1.9E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.05E-10	=	[	2.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.65E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	5.96E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.63E-08	=	[	5.2E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	1.11E-12	=	[	2.2E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	9.40E-10	=	[	1.9E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	6.33E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	1.72E-10	=	[	3.4E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	4.28E-12	=	[	8.5E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	8.58E-09	=	[	1.7E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Tin	2.47E-10	=	[	4.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	4.46E-11	=	[	8.9E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	3.73E-09	=	[	7.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.59E-09	=	[	7.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.42E-10	=	[	2.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	5.34E-12	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.55E-06	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	4.32E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.58E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	4.88E-08	=	[	3.3E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	6.57E-11	=	[	4.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Boron	8.79E-09	=	[	6.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	2.26E-11	=	[	1.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	2.32E-09	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.66E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.76E-09	=	[	1.9E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	3.06E-10	=	[	2.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.82E-06	=	[	3.3E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.74E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.67E-08	=	[	5.2E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	3.24E-12	=	[	2.2E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.74E-09	=	[	1.9E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.85E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	5.00E-10	=	[	3.4E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.25E-11	=	[	8.5E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	2.50E-08	=	[	1.7E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Tin	7.21E-10	=	[	4.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.30E-10	=	[	8.9E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.09E-08	=	[	7.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	1.05E-08	=	[	7.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Bis(2-ethylhexyl) phthalate	4.14E-10	=	[	2.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	1.56E-11	=	[	1.1E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	2.03E-08	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	9.68E-12	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.77E-08	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.66E-10	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	5.91E-08	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.82E-11	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	5.17E-08	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	1.94E-09	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.66E-04	x	0.00E+00	=	0.00E+00	4.85E-04	/	1.00E+00	=	4.85E-04
Antimony	4.64E-08	x	0.00E+00	=	0.00E+00	1.35E-07	/	4.00E-04	=	3.38E-04
Arsenic	1.69E-07	x	1.50E+00	=	2.54E-07	4.94E-07	/	3.00E-04	=	1.65E-03
Barium	5.24E-06	x	0.00E+00	=	0.00E+00	1.53E-05	/	2.00E-01	=	7.64E-05
Beryllium	7.04E-09	x	0.00E+00	=	0.00E+00	2.05E-08	/	2.00E-03	=	1.03E-05
Boron	9.43E-07	x	0.00E+00	=	0.00E+00	2.75E-06	/	2.00E-01	=	1.37E-05
Cadmium	2.43E-09	x	0.00E+00	=	0.00E+00	7.08E-09	/	1.00E-03	=	7.08E-06
Chromium	2.49E-07	x	0.00E+00	=	0.00E+00	7.26E-07	/	3.00E-03	=	2.42E-04
Cobalt	1.78E-07	x	0.00E+00	=	0.00E+00	5.18E-07	/	3.00E-04	=	1.73E-03
Copper	2.96E-07	x	0.00E+00	=	0.00E+00	8.64E-07	/	4.00E-02	=	2.16E-05
Fluoride	3.28E-08	x	0.00E+00	=	0.00E+00	9.58E-08	/	4.00E-02	=	2.40E-06
Iron	5.17E-04	x	0.00E+00	=	0.00E+00	1.51E-03	/	7.00E-01	=	2.16E-03
Lithium	1.86E-07	x	0.00E+00	=	0.00E+00	5.44E-07	/	2.00E-03	=	2.72E-04
Manganese	8.22E-06	x	0.00E+00	=	0.00E+00	2.40E-05	/	1.40E-01	=	1.71E-04
Mercury	3.48E-10	x	0.00E+00	=	0.00E+00	1.01E-09	/	0.00E+00	=	NA
Nickel	2.94E-07	x	0.00E+00	=	0.00E+00	8.58E-07	/	2.00E-02	=	4.29E-05
Nitrate	1.98E-07	x	0.00E+00	=	0.00E+00	5.78E-07	/	1.60E+00	=	3.61E-07
Nitrite	5.37E-08	x	0.00E+00	=	0.00E+00	1.57E-07	/	1.00E-01	=	1.57E-06
Silver	1.34E-09	x	0.00E+00	=	0.00E+00	3.91E-09	/	5.00E-03	=	7.82E-07
Strontium	2.68E-06	x	0.00E+00	=	0.00E+00	7.83E-06	/	6.00E-01	=	1.30E-05
Tin	7.73E-08	x	0.00E+00	=	0.00E+00	2.25E-07	/	6.00E-01	=	3.76E-07
Total Uranium	1.40E-08	x	0.00E+00	=	0.00E+00	4.07E-08	/	3.00E-03	=	1.36E-05
Vanadium	1.17E-06	x	0.00E+00	=	0.00E+00	3.40E-06	/	5.00E-03	=	6.80E-04
Zinc	1.12E-06	x	0.00E+00	=	0.00E+00	3.28E-06	/	3.00E-01	=	1.09E-05
Bis(2-ethylhexyl) phthalate	4.44E-08	x	1.40E-02	=	6.22E-10	1.30E-07	/	2.00E-02	=	6.48E-06
Butylbenzylphthalate	1.67E-09	x	1.90E-03	=	3.17E-12	4.87E-09	/	2.00E-01	=	2.44E-08
			Pathway total	=	2.55E-07			Pathway total	=	7.94E-03

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	5.31E-07	x		=	NA	1.55E-06	/[	5.00E-03	x	1000	]=	3.10E-07
Antimony	1.48E-10	x		=	NA	4.32E-10	/[		x	1000	]=	NA
Arsenic	5.41E-10	x	4.30E-03	=	2.33E-12	1.58E-09	/[	1.50E-05	x	1000	]=	1.05E-07
Barium	1.67E-08	x		=	NA	4.88E-08	/[	5.00E-04	x	1000	]=	9.77E-08
Beryllium	2.25E-11	x	2.40E-03	=	5.40E-14	6.57E-11	/[	2.00E-05	x	1000	]=	3.28E-09
Boron	3.01E-09	x	0.00E+00	=	0.00E+00	8.79E-09	/[	2.00E-02	x	1000	]=	4.39E-10
Cadmium	7.75E-12	x	1.80E-03	=	1.40E-14	2.26E-11	/[	1.00E-05	x	1000	]=	2.26E-09
Chromium	7.96E-10	x	8.40E-02	=	6.69E-11	2.32E-09	/[	1.00E-04	x	1000	]=	2.32E-08
Cobalt	5.68E-10	x	9.00E-03	=	5.11E-12	1.66E-09	/[	6.00E-06	x	1000	]=	2.76E-07
Copper	9.47E-10	x		=	NA	2.76E-09	/[		x	1000	]=	NA
Fluoride	1.05E-10	x		=	NA	3.06E-10	/[	1.30E-02	x	1000	]=	2.36E-11
Iron	1.65E-06	x		=	NA	4.82E-06	/[		x	1000	]=	NA
Lithium	5.96E-10	x		=	NA	1.74E-09	/[		x	1000	]=	NA
Manganese	2.63E-08	x		=	NA	7.67E-08	/[	5.00E-05	x	1000	]=	1.53E-06
Mercury	1.11E-12	x	0.00E+00	=	0.00E+00	3.24E-12	/[	3.00E-04	x	1000	]=	1.08E-11
Nickel	9.40E-10	x	2.60E-04	=	2.44E-13	2.74E-09	/[	9.00E-05	x	1000	]=	3.05E-08
Nitrate	6.33E-10	x		=	NA	1.85E-09	/[		x	1000	]=	NA
Nitrite	1.72E-10	x		=	NA	5.00E-10	/[		x	1000	]=	NA
Silver	4.28E-12	x		=	NA	1.25E-11	/[		x	1000	]=	NA
Strontium	8.58E-09	x		=	NA	2.50E-08	/[		x	1000	]=	NA
Tin	2.47E-10	x		=	NA	7.21E-10	/[		x	1000	]=	NA
Total Uranium	4.46E-11	x		=	NA	1.30E-10	/[	4.00E-05	x	1000	]=	3.25E-09
Vanadium	3.73E-09	x		=	NA	1.09E-08	/[	1.00E-04	x	1000	]=	1.09E-07
Zinc	3.59E-09	x		=	NA	1.05E-08	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.42E-10	x	2.40E-06	=	3.41E-16	4.14E-10	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	5.34E-12	x	0.00E+00	=	0.00E+00	1.56E-11	/		x	1000	]=	NA
			Pathway total =		7.46E-11					Pathway total =		2.49E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.03E-08	x	1.50E+00	=	3.04E-08	5.91E-08	/	3.00E-04	=	1.97E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	9.68E-12	x		=	NA	2.82E-11	/	2.50E-05	=	1.13E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	1.77E-08	x	1.40E-02	=	2.48E-10	5.17E-08	/	2.00E-02	=	2.59E-06
Butylbenzylphthalate	6.66E-10	x	1.90E-03	=	1.27E-12	1.94E-09	/	2.00E-01	=	9.72E-09
			Pathway total =		3.07E-08			Pathway total =		2.01E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-04
Arsenic	Sum of all pathways	=	2.85E-07	Sum of all pathways	=	1.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-05
Beryllium	Sum of all pathways	=	5.40E-14	Sum of all pathways	=	1.0E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Cadmium	Sum of all pathways	=	1.40E-14	Sum of all pathways	=	8.2E-06
Chromium	Sum of all pathways	=	6.69E-11	Sum of all pathways	=	2.4E-04
Cobalt	Sum of all pathways	=	5.11E-12	Sum of all pathways	=	1.7E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-11
Nickel	Sum of all pathways	=	2.44E-13	Sum of all pathways	=	4.3E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-07
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-07
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	8.70E-10	Sum of all pathways	=	9.1E-06
Butylbenzylphthalate	Sum of all pathways	=	4.44E-12	Sum of all pathways	=	3.4E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	2.85E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	8.14E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.37E-04	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.78E-09	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	7.73E-08	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.79E-06	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	3.52E-09	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.05E-09	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.08E-07	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.77E-07	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.61E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	2.71E-08	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	4.52E-04	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.52E-07	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	7.64E-06	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	3.67E-10	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	5.26E-08	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.82E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.65E-07	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	6.66E-08	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	2.90E-08	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	2.02E-09	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	6.66E-07	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.48E-08	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.27E-06	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	8.16E-07	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	9.92E-10	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
1-Butanol	4.77E-10	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.95E-08	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.27E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Hexane	1.30E-09	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	4.86E-10	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.01E-04	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.69E-08	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.25E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	5.23E-06	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.03E-08	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	5.99E-09	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	6.06E-07	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.17E-07	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	7.62E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	7.92E-08	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.32E-03	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	4.43E-07	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.23E-05	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.07E-09	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	1.53E-07	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	8.22E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	4.81E-07	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	1.94E-07	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	8.45E-08	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	5.88E-09	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	1.94E-06	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	4.31E-08	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	3.70E-06	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.38E-06	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	2.89E-09	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
1-Butanol	1.39E-09	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	1.15E-07	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	3.71E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Hexane	3.79E-09	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	1.42E-09	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.39E-07	=	[	8.8E-05	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.85E-11	=	[	3.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	2.47E-10	=	[	4.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	5.73E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.12E-11	=	[	2.2E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	6.56E-12	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	6.64E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	5.67E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	8.36E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	8.67E-11	=	[	1.7E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.45E-06	=	[	2.9E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	4.85E-10	=	[	9.7E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.44E-08	=	[	4.9E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	1.17E-12	=	[	2.3E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Molybdenum	1.68E-10	=	[	3.4E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	9.01E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	5.27E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	2.13E-10	=	[	4.2E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Selenium	9.26E-11	=	[	1.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	6.45E-12	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.13E-09	=	[	4.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	4.72E-11	=	[	9.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.06E-09	=	[	8.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	2.61E-09	=	[	5.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Acetone	3.17E-12	=	[	6.3E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
1-Butanol	1.52E-12	=	[	3.0E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.26E-10	=	[	2.5E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.06E-12	=	[	8.1E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Hexane	4.15E-12	=	[	8.3E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
beta-BHC	1.55E-12	=	[	3.1E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.28E-06	=	[	8.8E-05	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	5.39E-11	=	[	3.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	7.20E-10	=	[	4.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.67E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	3.28E-11	=	[	2.2E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	1.91E-11	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	1.94E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.65E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.44E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	2.53E-10	=	[	1.7E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.22E-06	=	[	2.9E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.42E-09	=	[	9.7E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.12E-08	=	[	4.9E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	3.42E-12	=	[	2.3E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Molybdenum	4.90E-10	=	[	3.4E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.63E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.54E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	6.20E-10	=	[	4.2E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Selenium	2.70E-10	=	[	1.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.88E-11	=	[	1.3E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	6.21E-09	=	[	4.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.38E-10	=	[	9.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.18E-08	=	[	8.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	7.61E-09	=	[	5.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Acetone	9.25E-12	=	[	6.3E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
1-Butanol	4.44E-12	=	[	3.0E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Bis(2-ethylhexyl) phthalate	3.68E-10	=	[	2.5E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	1.18E-11	=	[	8.1E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Hexane	1.21E-11	=	[	8.3E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
beta-BHC	4.53E-12	=	[	3.1E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	9.25E-09	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	8.19E-12	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
1-Butanol	1.90E-10	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.58E-08	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.07E-10	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	1.94E-10	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	2.70E-08	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.39E-11	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
1-Butanol	5.55E-10	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	4.60E-08	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	1.48E-09	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	5.66E-10	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.37E-04	x	0.00E+00	=	0.00E+00	4.01E-04	/	1.00E+00	=	4.01E-04
Antimony	5.78E-09	x	0.00E+00	=	0.00E+00	1.69E-08	/	4.00E-04	=	4.22E-05
Arsenic	7.73E-08	x	1.50E+00	=	1.16E-07	2.25E-07	/	3.00E-04	=	7.51E-04
Barium	1.79E-06	x	0.00E+00	=	0.00E+00	5.23E-06	/	2.00E-01	=	2.61E-05
Beryllium	3.52E-09	x	0.00E+00	=	0.00E+00	1.03E-08	/	2.00E-03	=	5.13E-06
Cadmium	2.05E-09	x	0.00E+00	=	0.00E+00	5.99E-09	/	1.00E-03	=	5.99E-06
Chromium	2.08E-07	x	0.00E+00	=	0.00E+00	6.06E-07	/	3.00E-03	=	2.02E-04
Cobalt	1.77E-07	x	0.00E+00	=	0.00E+00	5.17E-07	/	3.00E-04	=	1.72E-03
Copper	2.61E-07	x	0.00E+00	=	0.00E+00	7.62E-07	/	4.00E-02	=	1.91E-05
Fluoride	2.71E-08	x	0.00E+00	=	0.00E+00	7.92E-08	/	4.00E-02	=	1.98E-06
Iron	4.52E-04	x	0.00E+00	=	0.00E+00	1.32E-03	/	7.00E-01	=	1.88E-03
Lithium	1.52E-07	x	0.00E+00	=	0.00E+00	4.43E-07	/	2.00E-03	=	2.21E-04
Manganese	7.64E-06	x	0.00E+00	=	0.00E+00	2.23E-05	/	1.40E-01	=	1.59E-04
Mercury	3.67E-10	x	0.00E+00	=	0.00E+00	1.07E-09	/	0.00E+00	=	NA
Molybdenum	5.26E-08	x	0.00E+00	=	0.00E+00	1.53E-07	/	5.00E-03	=	3.07E-05
Nickel	2.82E-07	x	0.00E+00	=	0.00E+00	8.22E-07	/	2.00E-02	=	4.11E-05
Nitrate	1.65E-07	x	0.00E+00	=	0.00E+00	4.81E-07	/	1.60E+00	=	3.01E-07
Nitrite	6.66E-08	x	0.00E+00	=	0.00E+00	1.94E-07	/	1.00E-01	=	1.94E-06
Selenium	2.90E-08	x	0.00E+00	=	0.00E+00	8.45E-08	/	5.00E-03	=	1.69E-05
Silver	2.02E-09	x	0.00E+00	=	0.00E+00	5.88E-09	/	5.00E-03	=	1.18E-06
Strontium	6.66E-07	x	0.00E+00	=	0.00E+00	1.94E-06	/	6.00E-01	=	3.24E-06
Total Uranium	1.48E-08	x	0.00E+00	=	0.00E+00	4.31E-08	/	3.00E-03	=	1.44E-05
Vanadium	1.27E-06	x	0.00E+00	=	0.00E+00	3.70E-06	/	5.00E-03	=	7.40E-04
Zinc	8.16E-07	x	0.00E+00	=	0.00E+00	2.38E-06	/	3.00E-01	=	7.93E-06
Acetone	9.92E-10	x	0.00E+00	=	0.00E+00	2.89E-09	/	9.00E-01	=	3.21E-09
1-Butanol	4.77E-10	x	0.00E+00	=	0.00E+00	1.39E-09	/	1.00E-01	=	1.39E-08
Bis(2-ethylhexyl) phthalate	3.95E-08	x	1.40E-02	=	5.53E-10	1.15E-07	/	2.00E-02	=	5.76E-06
Butylbenzylphthalate	1.27E-09	x	1.90E-03	=	2.42E-12	3.71E-09	/	2.00E-01	=	1.85E-08
Hexane	1.30E-09	x	0.00E+00	=	0.00E+00	3.79E-09	/	6.00E-02	=	6.31E-08
beta-BHC	4.86E-10	x	1.80E+00	=	8.75E-10	1.42E-09	/	0.00E+00	=	NA
			Pathway total	=	1.17E-07			Pathway total	=	6.31E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.39E-07	x		=	NA	1.28E-06	/[	5.00E-03	x	1000	]=	2.56E-07
Antimony	1.85E-11	x		=	NA	5.39E-11	/[		x	1000	]=	NA
Arsenic	2.47E-10	x	4.30E-03	=	1.06E-12	7.20E-10	/[	1.50E-05	x	1000	]=	4.80E-08
Barium	5.73E-09	x		=	NA	1.67E-08	/[	5.00E-04	x	1000	]=	3.34E-08
Beryllium	1.12E-11	x	2.40E-03	=	2.70E-14	3.28E-11	/[	2.00E-05	x	1000	]=	1.64E-09
Cadmium	6.56E-12	x	1.80E-03	=	1.18E-14	1.91E-11	/[	1.00E-05	x	1000	]=	1.91E-09
Chromium	6.64E-10	x	8.40E-02	=	5.58E-11	1.94E-09	/[	1.00E-04	x	1000	]=	1.94E-08
Cobalt	5.67E-10	x	9.00E-03	=	5.10E-12	1.65E-09	/[	6.00E-06	x	1000	]=	2.76E-07
Copper	8.36E-10	x		=	NA	2.44E-09	/[		x	1000	]=	NA
Fluoride	8.67E-11	x		=	NA	2.53E-10	/[	1.30E-02	x	1000	]=	1.95E-11
Iron	1.45E-06	x		=	NA	4.22E-06	/[		x	1000	]=	NA
Lithium	4.85E-10	x		=	NA	1.42E-09	/[		x	1000	]=	NA
Manganese	2.44E-08	x		=	NA	7.12E-08	/[	5.00E-05	x	1000	]=	1.42E-06
Mercury	1.17E-12	x	0.00E+00	=	0.00E+00	3.42E-12	/[	3.00E-04	x	1000	]=	1.14E-11
Molybdenum	1.68E-10	x	0.00E+00	=	0.00E+00	4.90E-10	/[	0.00E+00	x	1000	]=	NA
Nickel	9.01E-10	x	2.60E-04	=	2.34E-13	2.63E-09	/[	9.00E-05	x	1000	]=	2.92E-08
Nitrate	5.27E-10	x		=	NA	1.54E-09	/[		x	1000	]=	NA
Nitrite	2.13E-10	x		=	NA	6.20E-10	/[		x	1000	]=	NA
Selenium	9.26E-11	x	0.00E+00	=	0.00E+00	2.70E-10	/[	2.00E-02	x	1000	]=	1.35E-11
Silver	6.45E-12	x		=	NA	1.88E-11	/[		x	1000	]=	NA
Strontium	2.13E-09	x		=	NA	6.21E-09	/[		x	1000	]=	NA
Total Uranium	4.72E-11	x		=	NA	1.38E-10	/[	4.00E-05	x	1000	]=	3.44E-09
Vanadium	4.06E-09	x		=	NA	1.18E-08	/[	1.00E-04	x	1000	]=	1.18E-07
Zinc	2.61E-09	x		=	NA	7.61E-09	/[		x	1000	]=	NA
Acetone	3.17E-12	x	0.00E+00	=	0.00E+00	9.25E-12	/[	3.10E+01	x	1000	]=	2.98E-16
1-Butanol	1.52E-12	x	0.00E+00	=	0.00E+00	4.44E-12	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.26E-10	x	2.40E-06	=	3.03E-16	3.68E-10	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	4.06E-12	x	0.00E+00	=	0.00E+00	1.18E-11	/[		x	1000	]=	NA
Hexane	4.15E-12	x	0.00E+00	=	0.00E+00	1.21E-11	/[	7.00E-01	x	1000	]=	1.73E-14
beta-BHC	1.55E-12	x	5.30E-04	=	8.24E-16	4.53E-12	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		6.22E-11					Pathway total =		2.21E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.25E-09	x	1.50E+00	=	1.39E-08	2.70E-08	/	3.00E-04	=	8.99E-05
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	8.19E-12	x		=	NA	2.39E-11	/	2.50E-05	=	9.56E-07
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	1.90E-10	x		=	NA	5.55E-10	/	1.00E-01	=	5.55E-09
Bis(2-ethylhexyl) phthalate	1.58E-08	x	1.40E-02	=	2.21E-10	4.60E-08	/	2.00E-02	=	2.30E-06
Butylbenzylphthalate	5.07E-10	x	1.90E-03	=	9.64E-13	1.48E-09	/	2.00E-01	=	7.40E-09
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	1.94E-10	x	1.80E+00	=	3.49E-10	5.66E-10	/		=	NA
			Pathway total =		1.44E-08			Pathway total =		9.32E-05

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-05
Arsenic	Sum of all pathways	=	1.30E-07	Sum of all pathways	=	8.4E-04
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-05
Beryllium	Sum of all pathways	=	2.70E-14	Sum of all pathways	=	5.1E-06
Cadmium	Sum of all pathways	=	1.18E-14	Sum of all pathways	=	6.9E-06
Chromium	Sum of all pathways	=	5.58E-11	Sum of all pathways	=	2.0E-04
Cobalt	Sum of all pathways	=	5.10E-12	Sum of all pathways	=	1.7E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-11
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-05
Nickel	Sum of all pathways	=	2.34E-13	Sum of all pathways	=	4.1E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-06
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-09
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.74E-10	Sum of all pathways	=	8.1E-06
Butylbenzylphthalate	Sum of all pathways	=	3.38E-12	Sum of all pathways	=	2.6E-08
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-08
beta-BHC	Sum of all pathways	=	1.22E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.32E-07	All Pathways and Chemicals	=	6.40E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.53E-04	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.05E-09	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.09E-07	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.75E-06	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	5.93E-09	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.59E-09	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.66E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.97E-07	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.74E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	6.17E-08	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.43E-04	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.80E-07	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	7.82E-06	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	4.12E-10	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.39E-07	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	2.46E-07	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	9.89E-08	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	3.81E-09	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	7.12E-07	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Tin	3.09E-07	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	3.37E-08	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.67E-06	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	3.94E-06	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	2.10E-10	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.94E-08	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.85E-08	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	2.88E-11	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	6.31E-12	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	5.54E-10	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1260	5.75E-10	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.46E-04	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.47E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.17E-07	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	5.10E-06	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.73E-08	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	7.56E-09	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	7.77E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.73E-07	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	8.00E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.80E-07	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.58E-03	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.24E-07	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.28E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.20E-09	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	6.96E-07	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	7.16E-07	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	2.89E-07	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	1.11E-08	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.08E-06	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Tin	9.02E-07	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	9.82E-08	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	4.87E-06	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	1.15E-05	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	6.14E-10	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	1.44E-07	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Di-n-butylphthalate	5.40E-08	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	8.39E-11	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	1.84E-11	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	1.62E-09	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1260	1.68E-09	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	4.89E-07	=	[	9.8E-05	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.61E-11	=	[	3.2E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	3.48E-10	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	5.59E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.89E-11	=	[	3.8E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	8.29E-12	=	[	1.7E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	8.51E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	6.28E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	8.76E-10	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.97E-10	=	[	3.9E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.74E-06	=	[	3.5E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	5.74E-10	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.50E-08	=	[	5.0E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	1.32E-12	=	[	2.6E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	7.62E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	7.85E-10	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	3.16E-10	=	[	6.3E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	1.22E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.27E-09	=	[	4.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Tin	9.88E-10	=	[	2.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	1.08E-10	=	[	2.1E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	5.34E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	1.26E-08	=	[	2.5E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Acetone	6.73E-13	=	[	1.3E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.58E-10	=	[	3.2E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	5.92E-11	=	[	1.2E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Methylene chloride	9.20E-14	=	[	1.8E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	2.02E-14	=	[	4.0E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
beta-BHC	1.77E-12	=	[	3.5E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Aroclor-1260	1.84E-12	=	[	3.7E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.43E-06	=	[	9.8E-05	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	4.71E-11	=	[	3.2E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.01E-09	=	[	6.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.63E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	5.53E-11	=	[	3.8E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	2.42E-11	=	[	1.7E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	2.48E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.83E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.56E-09	=	[	1.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	5.75E-10	=	[	3.9E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	5.07E-06	=	[	3.5E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.67E-09	=	[	1.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.29E-08	=	[	5.0E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	3.84E-12	=	[	2.6E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.22E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	2.29E-09	=	[	1.6E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	9.22E-10	=	[	6.3E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	3.55E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	6.63E-09	=	[	4.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Tin	2.88E-09	=	[	2.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	3.14E-10	=	[	2.1E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.56E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	3.67E-08	=	[	2.5E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Acetone	1.96E-12	=	[	1.3E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Bis(2-ethylhexyl) phthalate	4.60E-10	=	[	3.2E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Di-n-butylphthalate	1.73E-10	=	[	1.2E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Methylene chloride	2.68E-13	=	[	1.8E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	5.88E-14	=	[	4.0E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
beta-BHC	5.16E-12	=	[	3.5E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Aroclor-1260	5.36E-12	=	[	3.7E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.30E-08	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	1.03E-11	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.97E-08	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Di-n-butylphthalate	7.39E-09	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
beta-BHC	2.21E-10	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Aroclor-1260	3.21E-10	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.80E-08	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	3.02E-11	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Bis(2-ethylhexyl) phthalate	5.75E-08	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Di-n-butylphthalate	2.16E-08	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
beta-BHC	6.45E-10	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Aroclor-1260	9.37E-10	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.53E-04	x	0.00E+00	=	0.00E+00	4.46E-04	/	1.00E+00	=	4.46E-04
Antimony	5.05E-09	x	0.00E+00	=	0.00E+00	1.47E-08	/	4.00E-04	=	3.68E-05
Arsenic	1.09E-07	x	1.50E+00	=	1.63E-07	3.17E-07	/	3.00E-04	=	1.06E-03
Barium	1.75E-06	x	0.00E+00	=	0.00E+00	5.10E-06	/	2.00E-01	=	2.55E-05
Beryllium	5.93E-09	x	0.00E+00	=	0.00E+00	1.73E-08	/	2.00E-03	=	8.65E-06
Cadmium	2.59E-09	x	0.00E+00	=	0.00E+00	7.56E-09	/	1.00E-03	=	7.56E-06
Chromium	2.66E-07	x	0.00E+00	=	0.00E+00	7.77E-07	/	3.00E-03	=	2.59E-04
Cobalt	1.97E-07	x	0.00E+00	=	0.00E+00	5.73E-07	/	3.00E-04	=	1.91E-03
Copper	2.74E-07	x	0.00E+00	=	0.00E+00	8.00E-07	/	4.00E-02	=	2.00E-05
Fluoride	6.17E-08	x	0.00E+00	=	0.00E+00	1.80E-07	/	4.00E-02	=	4.50E-06
Iron	5.43E-04	x	0.00E+00	=	0.00E+00	1.58E-03	/	7.00E-01	=	2.26E-03
Lithium	1.80E-07	x	0.00E+00	=	0.00E+00	5.24E-07	/	2.00E-03	=	2.62E-04
Manganese	7.82E-06	x	0.00E+00	=	0.00E+00	2.28E-05	/	1.40E-01	=	1.63E-04
Mercury	4.12E-10	x	0.00E+00	=	0.00E+00	1.20E-09	/	0.00E+00	=	NA
Nickel	2.39E-07	x	0.00E+00	=	0.00E+00	6.96E-07	/	2.00E-02	=	3.48E-05
Nitrate	2.46E-07	x	0.00E+00	=	0.00E+00	7.16E-07	/	1.60E+00	=	4.48E-07
Nitrite	9.89E-08	x	0.00E+00	=	0.00E+00	2.89E-07	/	1.00E-01	=	2.89E-06
Silver	3.81E-09	x	0.00E+00	=	0.00E+00	1.11E-08	/	5.00E-03	=	2.22E-06
Strontium	7.12E-07	x	0.00E+00	=	0.00E+00	2.08E-06	/	6.00E-01	=	3.46E-06
Tin	3.09E-07	x	0.00E+00	=	0.00E+00	9.02E-07	/	6.00E-01	=	1.50E-06
Total Uranium	3.37E-08	x	0.00E+00	=	0.00E+00	9.82E-08	/	3.00E-03	=	3.27E-05
Vanadium	1.67E-06	x	0.00E+00	=	0.00E+00	4.87E-06	/	5.00E-03	=	9.74E-04
Zinc	3.94E-06	x	0.00E+00	=	0.00E+00	1.15E-05	/	3.00E-01	=	3.83E-05
Acetone	2.10E-10	x	0.00E+00	=	0.00E+00	6.14E-10	/	9.00E-01	=	6.82E-10
Bis(2-ethylhexyl) phthalate	4.94E-08	x	1.40E-02	=	6.91E-10	1.44E-07	/	2.00E-02	=	7.20E-06
Di-n-butylphthalate	1.85E-08	x	0.00E+00	=	0.00E+00	5.40E-08	/	1.00E-01	=	5.40E-07
Methylene chloride	2.88E-11	x	2.00E-03	=	5.76E-14	8.39E-11	/	6.00E-03	=	1.40E-08
Toluene	6.31E-12	x	0.00E+00	=	0.00E+00	1.84E-11	/	8.00E-02	=	2.30E-10
beta-BHC	5.54E-10	x	1.80E+00	=	9.97E-10	1.62E-09	/	0.00E+00	=	NA
Aroclor-1260	5.75E-10	x	2.00E+00	=	1.15E-09	1.68E-09	/	0.00E+00	=	NA
			Pathway total	=	1.66E-07			Pathway total	=	7.56E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	4.89E-07	x		=	NA	1.43E-06	/[	5.00E-03	x	1000	]=	2.85E-07
Antimony	1.61E-11	x		=	NA	4.71E-11	/[		x	1000	]=	NA
Arsenic	3.48E-10	x	4.30E-03	=	1.49E-12	1.01E-09	/[	1.50E-05	x	1000	]=	6.76E-08
Barium	5.59E-09	x		=	NA	1.63E-08	/[	5.00E-04	x	1000	]=	3.26E-08
Beryllium	1.89E-11	x	2.40E-03	=	4.55E-14	5.53E-11	/[	2.00E-05	x	1000	]=	2.76E-09
Cadmium	8.29E-12	x	1.80E-03	=	1.49E-14	2.42E-11	/[	1.00E-05	x	1000	]=	2.42E-09
Chromium	8.51E-10	x	8.40E-02	=	7.15E-11	2.48E-09	/[	1.00E-04	x	1000	]=	2.48E-08
Cobalt	6.28E-10	x	9.00E-03	=	5.66E-12	1.83E-09	/[	6.00E-06	x	1000	]=	3.05E-07
Copper	8.76E-10	x		=	NA	2.56E-09	/[		x	1000	]=	NA
Fluoride	1.97E-10	x		=	NA	5.75E-10	/[	1.30E-02	x	1000	]=	4.42E-11
Iron	1.74E-06	x		=	NA	5.07E-06	/[		x	1000	]=	NA
Lithium	5.74E-10	x		=	NA	1.67E-09	/[		x	1000	]=	NA
Manganese	2.50E-08	x		=	NA	7.29E-08	/[	5.00E-05	x	1000	]=	1.46E-06
Mercury	1.32E-12	x	0.00E+00	=	0.00E+00	3.84E-12	/[	3.00E-04	x	1000	]=	1.28E-11
Nickel	7.62E-10	x	2.60E-04	=	1.98E-13	2.22E-09	/[	9.00E-05	x	1000	]=	2.47E-08
Nitrate	7.85E-10	x		=	NA	2.29E-09	/[		x	1000	]=	NA
Nitrite	3.16E-10	x		=	NA	9.22E-10	/[		x	1000	]=	NA
Silver	1.22E-11	x		=	NA	3.55E-11	/[		x	1000	]=	NA
Strontium	2.27E-09	x		=	NA	6.63E-09	/[		x	1000	]=	NA
Tin	9.88E-10	x		=	NA	2.88E-09	/[		x	1000	]=	NA
Total Uranium	1.08E-10	x		=	NA	3.14E-10	/[	4.00E-05	x	1000	]=	7.85E-09
Vanadium	5.34E-09	x		=	NA	1.56E-08	/[	1.00E-04	x	1000	]=	1.56E-07
Zinc	1.26E-08	x		=	NA	3.67E-08	/[		x	1000	]=	NA
Acetone	6.73E-13	x	0.00E+00	=	0.00E+00	1.96E-12	/[	3.10E+01	x	1000	]=	6.33E-17
Bis(2-ethylhexyl) phthalate	1.58E-10	x	2.40E-06	=	3.79E-16	4.60E-10	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	5.92E-11	x	0.00E+00	=	0.00E+00	1.73E-10	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	9.20E-14	x	1.00E-08	=	9.20E-22	2.68E-13	/[	6.00E-01	x	1000	]=	4.47E-16
Toluene	2.02E-14	x	0.00E+00	=	0.00E+00	5.88E-14	/[	5.00E+00	x	1000	]=	1.18E-17
beta-BHC	1.77E-12	x	5.30E-04	=	9.38E-16	5.16E-12	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.84E-12	x	5.70E-04	=	1.05E-15	5.36E-12	/	0.00E+00	x	1000	]=	NA
			Pathway total =		7.89E-11					Pathway total =		2.37E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.30E-08	x	1.50E+00	=	1.95E-08	3.80E-08	/	3.00E-04	=	1.27E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.03E-11	x		=	NA	3.02E-11	/	2.50E-05	=	1.21E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	1.97E-08	x	1.40E-02	=	2.76E-10	5.75E-08	/	2.00E-02	=	2.87E-06
Di-n-butylphthalate	7.39E-09	x		=	NA	2.16E-08	/	1.00E-01	=	2.16E-07
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	2.21E-10	x	1.80E+00	=	3.98E-10	6.45E-10	/		=	NA
Aroclor-1260	3.21E-10	x	2.00E+00	=	6.43E-10	9.37E-10	/		=	NA
			Pathway total =		**2.08E-08**			Pathway total =		1.31E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-05
Arsenic	Sum of all pathways	=	1.83E-07	Sum of all pathways	=	1.2E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-05
Beryllium	Sum of all pathways	=	4.55E-14	Sum of all pathways	=	8.6E-06
Cadmium	Sum of all pathways	=	1.49E-14	Sum of all pathways	=	8.8E-06
Chromium	Sum of all pathways	=	7.15E-11	Sum of all pathways	=	2.6E-04
Cobalt	Sum of all pathways	=	5.66E-12	Sum of all pathways	=	1.9E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-11
Nickel	Sum of all pathways	=	1.98E-13	Sum of all pathways	=	3.5E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-06
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	9.7E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-10
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	9.67E-10	Sum of all pathways	=	1.0E-05
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-07
Methylene chloride	Sum of all pathways	=	5.76E-14	Sum of all pathways	=	1.4E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-10
beta-BHC	Sum of all pathways	=	1.39E-09	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	1.79E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.87E-07	All Pathways and Chemicals	=	7.70E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.80E-04	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	5.26E-09	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.25E-07	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	1.70E-06	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	3.76E-09	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	7.45E-08	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.40E-07	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	2.25E-07	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	3.18E-07	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	7.58E-08	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	5.56E-04	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.94E-07	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	8.78E-06	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	2.90E-10	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.36E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	8.52E-07	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	1.14E-07	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	1.51E-08	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Silver	1.49E-09	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	8.01E-07	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.42E-08	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.38E-06	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	1.04E-06	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	1.37E-10	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.30E-09	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
2-Hexanone	5.95E-11	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	3.01E-11	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	1.27E-11	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	5.25E-04	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.53E-08	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	3.65E-07	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	4.96E-06	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.10E-08	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	2.17E-07	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	7.01E-07	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	6.58E-07	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	9.27E-07	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	2.21E-07	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.62E-03	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.67E-07	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.56E-05	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	8.45E-10	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	6.89E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	2.49E-06	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	3.33E-07	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	4.39E-08	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Silver	4.35E-09	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	2.34E-06	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	4.13E-08	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	4.02E-06	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	3.04E-06	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	4.01E-10	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	6.70E-09	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
2-Hexanone	1.73E-10	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	8.77E-11	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	3.71E-11	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.76E-07	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	1.68E-11	=	[	3.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	4.00E-10	=	[	8.0E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	5.44E-09	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.20E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cadmium	2.38E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	7.69E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	7.21E-10	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	1.02E-09	=	[	2.0E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	2.42E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.78E-06	=	[	3.5E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	6.21E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.81E-08	=	[	5.6E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	9.26E-13	=	[	1.8E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	7.55E-10	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	2.72E-09	=	[	5.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	3.64E-10	=	[	7.3E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Selenium	4.81E-11	=	[	9.6E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Silver	4.76E-12	=	[	9.5E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	2.56E-09	=	[	5.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	4.53E-11	=	[	9.0E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	4.41E-09	=	[	8.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.34E-09	=	[	6.7E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Acetone	4.39E-13	=	[	8.8E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.34E-12	=	[	1.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
2-Hexanone	1.90E-13	=	[	3.8E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Methylene chloride	9.61E-14	=	[	1.9E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	4.06E-14	=	[	8.1E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.68E-06	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	4.90E-11	=	[	3.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.17E-09	=	[	8.0E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.59E-08	=	[	1.1E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	3.50E-11	=	[	2.4E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cadmium	6.95E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	2.24E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	2.10E-09	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.96E-09	=	[	2.0E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	7.07E-10	=	[	4.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	5.18E-06	=	[	3.5E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.81E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	8.19E-08	=	[	5.6E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	2.70E-12	=	[	1.8E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	2.20E-09	=	[	1.5E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	7.95E-09	=	[	5.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	1.06E-09	=	[	7.3E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Selenium	1.40E-10	=	[	9.6E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Silver	1.39E-11	=	[	9.5E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	7.47E-09	=	[	5.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.32E-10	=	[	9.0E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.29E-08	=	[	8.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	9.73E-09	=	[	6.7E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Acetone	1.28E-12	=	[	8.8E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Butylbenzylphthalate	2.14E-11	=	[	1.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
2-Hexanone	5.54E-13	=	[	3.8E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Methylene chloride	2.80E-13	=	[	1.9E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	1.18E-13	=	[	8.1E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.50E-08	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cadmium	2.97E-10	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Butylbenzylphthalate	9.17E-10	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	4.37E-08	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cadmium	8.67E-10	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Butylbenzylphthalate	2.67E-09	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	16	x	24	]	/	[	70	x	8,760	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.80E-04	x	0.00E+00	=	0.00E+00	5.25E-04	/	1.00E+00	=	5.25E-04
Antimony	5.26E-09	x	0.00E+00	=	0.00E+00	1.53E-08	/	4.00E-04	=	3.84E-05
Arsenic	1.25E-07	x	1.50E+00	=	1.88E-07	3.65E-07	/	3.00E-04	=	1.22E-03
Barium	1.70E-06	x	0.00E+00	=	0.00E+00	4.96E-06	/	2.00E-01	=	2.48E-05
Beryllium	3.76E-09	x	0.00E+00	=	0.00E+00	1.10E-08	/	2.00E-03	=	5.48E-06
Cadmium	7.45E-08	x	0.00E+00	=	0.00E+00	2.17E-07	/	1.00E-03	=	2.17E-04
Chromium	2.40E-07	x	0.00E+00	=	0.00E+00	7.01E-07	/	3.00E-03	=	2.34E-04
Cobalt	2.25E-07	x	0.00E+00	=	0.00E+00	6.58E-07	/	3.00E-04	=	2.19E-03
Copper	3.18E-07	x	0.00E+00	=	0.00E+00	9.27E-07	/	4.00E-02	=	2.32E-05
Fluoride	7.58E-08	x	0.00E+00	=	0.00E+00	2.21E-07	/	4.00E-02	=	5.53E-06
Iron	5.56E-04	x	0.00E+00	=	0.00E+00	1.62E-03	/	7.00E-01	=	2.32E-03
Lithium	1.94E-07	x	0.00E+00	=	0.00E+00	5.67E-07	/	2.00E-03	=	2.83E-04
Manganese	8.78E-06	x	0.00E+00	=	0.00E+00	2.56E-05	/	1.40E-01	=	1.83E-04
Mercury	2.90E-10	x	0.00E+00	=	0.00E+00	8.45E-10	/	0.00E+00	=	NA
Nickel	2.36E-07	x	0.00E+00	=	0.00E+00	6.89E-07	/	2.00E-02	=	3.44E-05
Nitrate	8.52E-07	x	0.00E+00	=	0.00E+00	2.49E-06	/	1.60E+00	=	1.55E-06
Nitrite	1.14E-07	x	0.00E+00	=	0.00E+00	3.33E-07	/	1.00E-01	=	3.33E-06
Selenium	1.51E-08	x	0.00E+00	=	0.00E+00	4.39E-08	/	5.00E-03	=	8.78E-06
Silver	1.49E-09	x	0.00E+00	=	0.00E+00	4.35E-09	/	5.00E-03	=	8.69E-07
Strontium	8.01E-07	x	0.00E+00	=	0.00E+00	2.34E-06	/	6.00E-01	=	3.89E-06
Total Uranium	1.42E-08	x	0.00E+00	=	0.00E+00	4.13E-08	/	3.00E-03	=	1.38E-05
Vanadium	1.38E-06	x	0.00E+00	=	0.00E+00	4.02E-06	/	5.00E-03	=	8.04E-04
Zinc	1.04E-06	x	0.00E+00	=	0.00E+00	3.04E-06	/	3.00E-01	=	1.01E-05
Acetone	1.37E-10	x	0.00E+00	=	0.00E+00	4.01E-10	/	9.00E-01	=	4.45E-10
Butylbenzylphthalate	2.30E-09	x	1.90E-03	=	4.36E-12	6.70E-09	/	2.00E-01	=	3.35E-08
2-Hexanone	5.95E-11	x	0.00E+00	=	0.00E+00	1.73E-10	/	5.00E-03	=	3.47E-08
Methylene chloride	3.01E-11	x	2.00E-03	=	6.01E-14	8.77E-11	/	6.00E-03	=	1.46E-08
Toluene	1.27E-11	x	0.00E+00	=	0.00E+00	3.71E-11	/	8.00E-02	=	4.63E-10
			Pathway total	=	1.88E-07			Pathway total	=	8.15E-03

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	5.76E-07	x		=	NA	1.68E-06	/[	5.00E-03	x	1000	]=	3.36E-07
Antimony	1.68E-11	x		=	NA	4.90E-11	/[		x	1000	]=	NA
Arsenic	4.00E-10	x	4.30E-03	=	1.72E-12	1.17E-09	/[	1.50E-05	x	1000	]=	7.78E-08
Barium	5.44E-09	x		=	NA	1.59E-08	/[	5.00E-04	x	1000	]=	3.17E-08
Beryllium	1.20E-11	x	2.40E-03	=	2.88E-14	3.50E-11	/[	2.00E-05	x	1000	]=	1.75E-09
Cadmium	2.38E-10	x	1.80E-03	=	4.29E-13	6.95E-10	/[	1.00E-05	x	1000	]=	6.95E-08
Chromium	7.69E-10	x	8.40E-02	=	6.46E-11	2.24E-09	/[	1.00E-04	x	1000	]=	2.24E-08
Cobalt	7.21E-10	x	9.00E-03	=	6.49E-12	2.10E-09	/[	6.00E-06	x	1000	]=	3.50E-07
Copper	1.02E-09	x		=	NA	2.96E-09	/[		x	1000	]=	NA
Fluoride	2.42E-10	x		=	NA	7.07E-10	/[	1.30E-02	x	1000	]=	5.44E-11
Iron	1.78E-06	x		=	NA	5.18E-06	/[		x	1000	]=	NA
Lithium	6.21E-10	x		=	NA	1.81E-09	/[		x	1000	]=	NA
Manganese	2.81E-08	x		=	NA	8.19E-08	/[	5.00E-05	x	1000	]=	1.64E-06
Mercury	9.26E-13	x	0.00E+00	=	0.00E+00	2.70E-12	/[	3.00E-04	x	1000	]=	9.01E-12
Nickel	7.55E-10	x	2.60E-04	=	1.96E-13	2.20E-09	/[	9.00E-05	x	1000	]=	2.45E-08
Nitrate	2.72E-09	x		=	NA	7.95E-09	/[		x	1000	]=	NA
Nitrite	3.64E-10	x		=	NA	1.06E-09	/[		x	1000	]=	NA
Selenium	4.81E-11	x	0.00E+00	=	0.00E+00	1.40E-10	/[	2.00E-02	x	1000	]=	7.02E-12
Silver	4.76E-12	x		=	NA	1.39E-11	/[		x	1000	]=	NA
Strontium	2.56E-09	x		=	NA	7.47E-09	/[		x	1000	]=	NA
Total Uranium	4.53E-11	x		=	NA	1.32E-10	/[	4.00E-05	x	1000	]=	3.30E-09
Vanadium	4.41E-09	x		=	NA	1.29E-08	/[	1.00E-04	x	1000	]=	1.29E-07
Zinc	3.34E-09	x		=	NA	9.73E-09	/[		x	1000	]=	NA
Acetone	4.39E-13	x	0.00E+00	=	0.00E+00	1.28E-12	/[	3.10E+01	x	1000	]=	4.13E-17
Butylbenzylphthalate	7.34E-12	x	0.00E+00	=	0.00E+00	2.14E-11	/[		x	1000	]=	NA
2-Hexanone	1.90E-13	x	0.00E+00	=	0.00E+00	5.54E-13	/[	3.00E-02	x	1000	]=	1.85E-14
Methylene chloride	9.61E-14	x	1.00E-08	=	9.61E-22	2.80E-13	/[	6.00E-01	x	1000	]=	4.67E-16
Toluene	4.06E-14	x	0.00E+00	=	0.00E+00	1.18E-13	/[	5.00E+00	x	1000	]=	2.37E-17
			Pathway total =		7.34E-11					Pathway total =		2.68E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.50E-08	x	1.50E+00	=	2.25E-08	4.37E-08	/	3.00E-04	=	1.46E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.97E-10	x		=	NA	8.67E-10	/	2.50E-05	=	3.47E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	9.17E-10	x	1.90E-03	=	1.74E-12	2.67E-09	/	2.00E-01	=	1.34E-08
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		**2.25E-08**			Pathway total =		1.80E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Arsenic	Sum of all pathways	=	2.10E-07	Sum of all pathways	=	1.4E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Beryllium	Sum of all pathways	=	2.88E-14	Sum of all pathways	=	5.5E-06
Cadmium	Sum of all pathways	=	4.29E-13	Sum of all pathways	=	2.5E-04
Chromium	Sum of all pathways	=	6.46E-11	Sum of all pathways	=	2.3E-04
Cobalt	Sum of all pathways	=	6.49E-12	Sum of all pathways	=	2.2E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-12
Nickel	Sum of all pathways	=	1.96E-13	Sum of all pathways	=	3.4E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-07
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-10
Butylbenzylphthalate	Sum of all pathways	=	6.11E-12	Sum of all pathways	=	4.7E-08
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-08
Methylene chloride	Sum of all pathways	=	6.01E-14	Sum of all pathways	=	1.5E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-10

Total Carcinogenic Risk All Pathways and Chemicals	=	2.10E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	8.33E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.78E-04	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	6.25E-09	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.50E-07	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Barium	2.08E-06	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	5.05E-09	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Boron	1.38E-07	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	2.15E-07	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	1.87E-07	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Copper	2.83E-07	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	4.34E-08	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Iron	4.96E-04	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	1.98E-07	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	7.82E-06	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	4.42E-10	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	5.43E-08	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	2.10E-07	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	1.83E-07	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	4.70E-08	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	4.29E-08	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	1.06E-06	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	1.33E-08	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	1.11E-06	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	9.73E-07	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	1.33E-10	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Benzene	7.04E-12	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	8.09E-12	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	1.58E-11	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	5.18E-04	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	1.82E-08	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	4.38E-07	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Barium	6.07E-06	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	1.47E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Boron	4.02E-07	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	6.26E-07	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	5.47E-07	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Copper	8.27E-07	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	1.26E-07	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Iron	1.45E-03	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	5.79E-07	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	2.28E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	1.29E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	1.58E-07	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	6.14E-07	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	5.33E-07	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	1.37E-07	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	1.25E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	3.11E-06	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	3.87E-08	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	3.25E-06	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	2.84E-06	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	3.87E-10	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Benzene	2.05E-11	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	2.36E-11	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	4.62E-11	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	16	x	24	]	/	[	70	x	8,760	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.68E-07	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Antimony	2.00E-11	=	[	4.0E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Arsenic	4.80E-10	=	[	9.6E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Barium	6.65E-09	=	[	1.3E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Beryllium	1.61E-11	=	[	3.2E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Boron	4.41E-10	=	[	8.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Chromium	6.86E-10	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Cobalt	5.99E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Copper	9.06E-10	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Fluoride	1.39E-10	=	[	2.8E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Iron	1.59E-06	=	[	3.2E-04	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Lithium	6.34E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Manganese	2.50E-08	=	[	5.0E-06	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Mercury	1.41E-12	=	[	2.8E-10	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Molybdenum	1.74E-10	=	[	3.5E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nickel	6.73E-10	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrate	5.84E-10	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Nitrite	1.50E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Selenium	1.37E-10	=	[	2.7E-08	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Strontium	3.40E-09	=	[	6.8E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Total Uranium	4.24E-11	=	[	8.5E-09	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Vanadium	3.56E-09	=	[	7.1E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Zinc	3.11E-09	=	[	6.2E-07	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Acetone	4.24E-13	=	[	8.5E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Benzene	2.25E-14	=	[	4.5E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Styrene	2.59E-14	=	[	5.2E-12	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]
Toluene	5.06E-14	=	[	1.0E-11	x	16	x	8.0	x	24	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.66E-06	=	[	1.1E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Antimony	5.82E-11	=	[	4.0E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Arsenic	1.40E-09	=	[	9.6E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Barium	1.94E-08	=	[	1.3E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Beryllium	4.70E-11	=	[	3.2E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Boron	1.29E-09	=	[	8.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Chromium	2.00E-09	=	[	1.4E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Cobalt	1.75E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Copper	2.64E-09	=	[	1.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Fluoride	4.04E-10	=	[	2.8E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Iron	4.62E-06	=	[	3.2E-04	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Lithium	1.85E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Manganese	7.29E-08	=	[	5.0E-06	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Mercury	4.12E-12	=	[	2.8E-10	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Molybdenum	5.06E-10	=	[	3.5E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nickel	1.96E-09	=	[	1.3E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrate	1.70E-09	=	[	1.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Nitrite	4.38E-10	=	[	3.0E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Selenium	4.00E-10	=	[	2.7E-08	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Strontium	9.93E-09	=	[	6.8E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Total Uranium	1.24E-10	=	[	8.5E-09	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Vanadium	1.04E-08	=	[	7.1E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Zinc	9.07E-09	=	[	6.2E-07	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Acetone	1.24E-12	=	[	8.5E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Benzene	6.57E-14	=	[	4.5E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Styrene	7.55E-14	=	[	5.2E-12	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]
Toluene	1.48E-13	=	[	1.0E-11	x	16	x	8.0	x	24	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Arsenic	1.80E-08	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	16	x	24	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Arsenic	5.25E-08	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	16	x	24	]	/	[	70	x	8,760	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	16	x	24	]	/	[	70	x	8,760	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
SCT = skin contact time
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.78E-04	x	0.00E+00	=	0.00E+00	5.18E-04	/	1.00E+00	=	5.18E-04
Antimony	6.25E-09	x	0.00E+00	=	0.00E+00	1.82E-08	/	4.00E-04	=	4.56E-05
Arsenic	1.50E-07	x	1.50E+00	=	2.25E-07	4.38E-07	/	3.00E-04	=	1.46E-03
Barium	2.08E-06	x	0.00E+00	=	0.00E+00	6.07E-06	/	2.00E-01	=	3.03E-05
Beryllium	5.05E-09	x	0.00E+00	=	0.00E+00	1.47E-08	/	2.00E-03	=	7.36E-06
Boron	1.38E-07	x	0.00E+00	=	0.00E+00	4.02E-07	/	2.00E-01	=	2.01E-06
Chromium	2.15E-07	x	0.00E+00	=	0.00E+00	6.26E-07	/	3.00E-03	=	2.09E-04
Cobalt	1.87E-07	x	0.00E+00	=	0.00E+00	5.47E-07	/	3.00E-04	=	1.82E-03
Copper	2.83E-07	x	0.00E+00	=	0.00E+00	8.27E-07	/	4.00E-02	=	2.07E-05
Fluoride	4.34E-08	x	0.00E+00	=	0.00E+00	1.26E-07	/	4.00E-02	=	3.16E-06
Iron	4.96E-04	x	0.00E+00	=	0.00E+00	1.45E-03	/	7.00E-01	=	2.07E-03
Lithium	1.98E-07	x	0.00E+00	=	0.00E+00	5.79E-07	/	2.00E-03	=	2.89E-04
Manganese	7.82E-06	x	0.00E+00	=	0.00E+00	2.28E-05	/	1.40E-01	=	1.63E-04
Mercury	4.42E-10	x	0.00E+00	=	0.00E+00	1.29E-09	/	0.00E+00	=	NA
Molybdenum	5.43E-08	x	0.00E+00	=	0.00E+00	1.58E-07	/	5.00E-03	=	3.17E-05
Nickel	2.10E-07	x	0.00E+00	=	0.00E+00	6.14E-07	/	2.00E-02	=	3.07E-05
Nitrate	1.83E-07	x	0.00E+00	=	0.00E+00	5.33E-07	/	1.60E+00	=	3.33E-07
Nitrite	4.70E-08	x	0.00E+00	=	0.00E+00	1.37E-07	/	1.00E-01	=	1.37E-06
Selenium	4.29E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	5.00E-03	=	2.50E-05
Strontium	1.06E-06	x	0.00E+00	=	0.00E+00	3.11E-06	/	6.00E-01	=	5.18E-06
Total Uranium	1.33E-08	x	0.00E+00	=	0.00E+00	3.87E-08	/	3.00E-03	=	1.29E-05
Vanadium	1.11E-06	x	0.00E+00	=	0.00E+00	3.25E-06	/	5.00E-03	=	6.50E-04
Zinc	9.73E-07	x	0.00E+00	=	0.00E+00	2.84E-06	/	3.00E-01	=	9.46E-06
Acetone	1.33E-10	x	0.00E+00	=	0.00E+00	3.87E-10	/	9.00E-01	=	4.30E-10
Benzene	7.04E-12	x	5.50E-02	=	3.87E-13	2.05E-11	/	4.00E-03	=	5.14E-09
Styrene	8.09E-12	x	0.00E+00	=	0.00E+00	2.36E-11	/	2.00E-01	=	1.18E-10
Toluene	1.58E-11	x	0.00E+00	=	0.00E+00	4.62E-11	/	8.00E-02	=	5.78E-10
			Pathway total	=	2.25E-07			Pathway total	=	7.40E-03

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	5.68E-07	x		=	NA	1.66E-06	/[	5.00E-03	x	1000	]=	3.31E-07
Antimony	2.00E-11	x		=	NA	5.82E-11	/[		x	1000	]=	NA
Arsenic	4.80E-10	x	4.30E-03	=	2.07E-12	1.40E-09	/[	1.50E-05	x	1000	]=	9.34E-08
Barium	6.65E-09	x		=	NA	1.94E-08	/[	5.00E-04	x	1000	]=	3.88E-08
Beryllium	1.61E-11	x	2.40E-03	=	3.87E-14	4.70E-11	/[	2.00E-05	x	1000	]=	2.35E-09
Boron	4.41E-10	x	0.00E+00	=	0.00E+00	1.29E-09	/[	2.00E-02	x	1000	]=	6.43E-11
Chromium	6.86E-10	x	8.40E-02	=	5.76E-11	2.00E-09	/[	1.00E-04	x	1000	]=	2.00E-08
Cobalt	5.99E-10	x	9.00E-03	=	5.39E-12	1.75E-09	/[	6.00E-06	x	1000	]=	2.91E-07
Copper	9.06E-10	x		=	NA	2.64E-09	/[		x	1000	]=	NA
Fluoride	1.39E-10	x		=	NA	4.04E-10	/[	1.30E-02	x	1000	]=	3.11E-11
Iron	1.59E-06	x		=	NA	4.62E-06	/[		x	1000	]=	NA
Lithium	6.34E-10	x		=	NA	1.85E-09	/[		x	1000	]=	NA
Manganese	2.50E-08	x		=	NA	7.29E-08	/[	5.00E-05	x	1000	]=	1.46E-06
Mercury	1.41E-12	x	0.00E+00	=	0.00E+00	4.12E-12	/[	3.00E-04	x	1000	]=	1.37E-11
Molybdenum	1.74E-10	x	0.00E+00	=	0.00E+00	5.06E-10	/[	0.00E+00	x	1000	]=	NA
Nickel	6.73E-10	x	2.60E-04	=	1.75E-13	1.96E-09	/[	9.00E-05	x	1000	]=	2.18E-08
Nitrate	5.84E-10	x		=	NA	1.70E-09	/[		x	1000	]=	NA
Nitrite	1.50E-10	x		=	NA	4.38E-10	/[		x	1000	]=	NA
Selenium	1.37E-10	x	0.00E+00	=	0.00E+00	4.00E-10	/[	2.00E-02	x	1000	]=	2.00E-11
Strontium	3.40E-09	x		=	NA	9.93E-09	/[		x	1000	]=	NA
Total Uranium	4.24E-11	x		=	NA	1.24E-10	/[	4.00E-05	x	1000	]=	3.09E-09
Vanadium	3.56E-09	x		=	NA	1.04E-08	/[	1.00E-04	x	1000	]=	1.04E-07
Zinc	3.11E-09	x		=	NA	9.07E-09	/[		x	1000	]=	NA
Acetone	4.24E-13	x	0.00E+00	=	0.00E+00	1.24E-12	/[	3.10E+01	x	1000	]=	3.99E-17
Benzene	2.25E-14	x	7.80E-06	=	1.76E-19	6.57E-14	/[	3.00E-02	x	1000	]=	2.19E-15
Styrene	2.59E-14	x	0.00E+00	=	0.00E+00	7.55E-14	/[	1.00E+00	x	1000	]=	7.55E-17
Toluene	5.06E-14	x	0.00E+00	=	0.00E+00	1.48E-13	/[	5.00E+00	x	1000	]=	2.95E-17
			Pathway total =		6.53E-11					Pathway total =		2.36E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.80E-08	x	1.50E+00	=	2.70E-08	5.25E-08	/	3.00E-04	=	1.75E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		2.70E-08			Pathway total =		1.75E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-04
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-05
Arsenic	Sum of all pathways	=	2.52E-07	Sum of all pathways	=	1.6E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-05
Beryllium	Sum of all pathways	=	3.87E-14	Sum of all pathways	=	7.4E-06
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-06
Chromium	Sum of all pathways	=	5.76E-11	Sum of all pathways	=	2.1E-04
Cobalt	Sum of all pathways	=	5.39E-12	Sum of all pathways	=	1.8E-03
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-06
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-03
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-04
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-11
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-05
Nickel	Sum of all pathways	=	1.75E-13	Sum of all pathways	=	3.1E-05
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-04
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-06
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-10
Benzene	Sum of all pathways	=	3.87E-13	Sum of all pathways	=	5.1E-09
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-10

Total Carcinogenic Risk All Pathways and Chemicals	=	2.52E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	7.58E-03

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for CERCLA Adult Trespasser Scenario

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	1E-07	7E-07	2E-07	1E-07	2E-07	3E-07	1E-07	2E-07	2E-07	2E-07
Inhalation	6E-11	9E-11	1E-10	6E-11	1E-10	7E-11	6E-11	8E-11	7E-11	7E-11
Dermal Contact	1E-08	8E-08	2E-08	1E-08	2E-08	3E-08	1E-08	2E-08	2E-08	3E-08
ELCR	1E-07	8E-07	2E-07	1E-07	2E-07	3E-07	1E-07	2E-07	2E-07	3E-07
Major Risk Contributors	None									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	7E-03	1E-02	8E-03	7E-03	8E-03	8E-03	6E-03	8E-03	8E-03	7E-03
Inhalation	2E-06	3E-06	3E-06	2E-06	3E-06	2E-06	2E-06	2E-06	3E-06	2E-06
Dermal Contact	1E-04	5E-04	2E-04	9E-05	1E-04	2E-04	9E-05	1E-04	2E-04	2E-04
HI	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Major Hazard Contributors	None									

Appendix C

Attachment C-6: Results of Nonradiological Risk Assessment under Trespasser Youth Receptor Scenario

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.98E-04	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	1.05E-08	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	1.48E-07	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.35E-06	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	3.82E-09	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	3.76E-07	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.59E-07	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.03E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	8.78E-08	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.50E-04	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.29E-07	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.40E-05	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	4.28E-07	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	3.58E-07	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	3.65E-08	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	1.90E-09	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.49E-06	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Tin	4.58E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.28E-08	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.37E-06	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.80E-06	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Diethylphthalate	1.34E-08	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1254	2.97E-10	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.98E-03	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	1.05E-07	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	1.48E-06	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.35E-05	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	3.82E-08	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	3.76E-06	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.59E-06	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.03E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	8.78E-07	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.50E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.29E-06	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.40E-04	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	4.28E-06	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	3.58E-06	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	3.65E-07	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	1.90E-08	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.49E-05	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Tin	4.58E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.28E-07	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.37E-05	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.80E-05	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Diethylphthalate	1.34E-07	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1254	2.97E-09	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m³		ug/m³		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	6.80E-07	=	[	1.0E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.39E-11	=	[	3.6E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	3.38E-10	=	[	5.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	7.66E-09	=	[	1.2E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	8.71E-12	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	8.59E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	8.19E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.15E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	2.00E-10	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.17E-06	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	7.50E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.19E-08	=	[	4.8E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	9.77E-10	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	8.16E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	8.33E-11	=	[	1.3E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	4.35E-12	=	[	6.6E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	3.40E-09	=	[	5.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Tin	1.04E-09	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	5.20E-11	=	[	7.9E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	5.40E-09	=	[	8.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.11E-09	=	[	6.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Diethylphthalate	3.06E-11	=	[	4.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Aroclor-1254	6.79E-13	=	[	1.0E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	6.80E-06	=	[	1.0E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.39E-10	=	[	3.6E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	3.38E-09	=	[	5.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	7.66E-08	=	[	1.2E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	8.71E-11	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	8.59E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	8.19E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.15E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	2.00E-09	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.17E-05	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	7.50E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.19E-07	=	[	4.8E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	9.77E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	8.16E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	8.33E-10	=	[	1.3E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	4.35E-11	=	[	6.6E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	3.40E-08	=	[	5.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Tin	1.04E-08	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	5.20E-10	=	[	7.9E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	5.40E-08	=	[	8.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.11E-08	=	[	6.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Diethylphthalate	3.06E-10	=	[	4.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Aroclor-1254	6.79E-12	=	[	1.0E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.49E-08	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	2.14E-11	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Diethylphthalate	7.51E-09	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1254	2.33E-10	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.49E-07	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	2.14E-10	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Diethylphthalate	7.51E-08	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1254	2.33E-09	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.98E-04	x	0.00E+00	=	0.00E+00	2.98E-03	/	1.00E+00	=	2.98E-03
Antimony	1.05E-08	x	0.00E+00	=	0.00E+00	1.05E-07	/	4.00E-04	=	2.62E-04
Arsenic	1.48E-07	x	1.50E+00	=	2.22E-07	1.48E-06	/	3.00E-04	=	4.93E-03
Barium	3.35E-06	x	0.00E+00	=	0.00E+00	3.35E-05	/	2.00E-01	=	1.68E-04
Cadmium	3.82E-09	x	0.00E+00	=	0.00E+00	3.82E-08	/	1.00E-03	=	3.82E-05
Chromium	3.76E-07	x	0.00E+00	=	0.00E+00	3.76E-06	/	3.00E-03	=	1.25E-03
Cobalt	3.59E-07	x	0.00E+00	=	0.00E+00	3.59E-06	/	3.00E-04	=	1.20E-02
Copper	5.03E-07	x	0.00E+00	=	0.00E+00	5.03E-06	/	4.00E-02	=	1.26E-04
Fluoride	8.78E-08	x	0.00E+00	=	0.00E+00	8.78E-07	/	4.00E-02	=	2.19E-05
Iron	9.50E-04	x	0.00E+00	=	0.00E+00	9.50E-03	/	7.00E-01	=	1.36E-02
Lithium	3.29E-07	x	0.00E+00	=	0.00E+00	3.29E-06	/	2.00E-03	=	1.64E-03
Manganese	1.40E-05	x	0.00E+00	=	0.00E+00	1.40E-04	/	1.40E-01	=	9.98E-04
Nickel	4.28E-07	x	0.00E+00	=	0.00E+00	4.28E-06	/	2.00E-02	=	2.14E-04
Nitrate	3.58E-07	x	0.00E+00	=	0.00E+00	3.58E-06	/	1.60E+00	=	2.23E-06
Nitrite	3.65E-08	x	0.00E+00	=	0.00E+00	3.65E-07	/	1.00E-01	=	3.65E-06
Silver	1.90E-09	x	0.00E+00	=	0.00E+00	1.90E-08	/	5.00E-03	=	3.81E-06
Strontium	1.49E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	6.00E-01	=	2.48E-05
Tin	4.58E-07	x	0.00E+00	=	0.00E+00	4.58E-06	/	6.00E-01	=	7.63E-06
Total Uranium	2.28E-08	x	0.00E+00	=	0.00E+00	2.28E-07	/	3.00E-03	=	7.59E-05
Vanadium	2.37E-06	x	0.00E+00	=	0.00E+00	2.37E-05	/	5.00E-03	=	4.73E-03
Zinc	1.80E-06	x	0.00E+00	=	0.00E+00	1.80E-05	/	3.00E-01	=	6.00E-05
Diethylphthalate	1.34E-08	x	0.00E+00	=	0.00E+00	1.34E-07	/	8.00E-01	=	1.68E-07
Aroclor-1254	2.97E-10	x	2.00E+00	=	5.95E-10	2.97E-09	/	2.00E-05	=	1.49E-04
			Pathway total	=	2.23E-07			Pathway total	=	4.32E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	6.80E-07	x		=	NA	6.80E-06	/[	5.00E-03	x	1000	]=	1.36E-06
Antimony	2.39E-11	x		=	NA	2.39E-10	/[		x	1000	]=	NA
Arsenic	3.38E-10	x	4.30E-03	=	1.45E-12	3.38E-09	/[	1.50E-05	x	1000	]=	2.25E-07
Barium	7.66E-09	x		=	NA	7.66E-08	/[	5.00E-04	x	1000	]=	1.53E-07
Cadmium	8.71E-12	x	1.80E-03	=	1.57E-14	8.71E-11	/[	1.00E-05	x	1000	]=	8.71E-09
Chromium	8.59E-10	x	8.40E-02	=	7.22E-11	8.59E-09	/[	1.00E-04	x	1000	]=	8.59E-08
Cobalt	8.19E-10	x	9.00E-03	=	7.37E-12	8.19E-09	/[	6.00E-06	x	1000	]=	1.37E-06
Copper	1.15E-09	x		=	NA	1.15E-08	/[		x	1000	]=	NA
Fluoride	2.00E-10	x		=	NA	2.00E-09	/[	1.30E-02	x	1000	]=	1.54E-10
Iron	2.17E-06	x		=	NA	2.17E-05	/[		x	1000	]=	NA
Lithium	7.50E-10	x		=	NA	7.50E-09	/[		x	1000	]=	NA
Manganese	3.19E-08	x		=	NA	3.19E-07	/[	5.00E-05	x	1000	]=	6.38E-06
Nickel	9.77E-10	x	2.60E-04	=	2.54E-13	9.77E-09	/[	9.00E-05	x	1000	]=	1.09E-07
Nitrate	8.16E-10	x		=	NA	8.16E-09	/[		x	1000	]=	NA
Nitrite	8.33E-11	x		=	NA	8.33E-10	/[		x	1000	]=	NA
Silver	4.35E-12	x		=	NA	4.35E-11	/[		x	1000	]=	NA
Strontium	3.40E-09	x		=	NA	3.40E-08	/[		x	1000	]=	NA
Tin	1.04E-09	x		=	NA	1.04E-08	/[		x	1000	]=	NA
Total Uranium	5.20E-11	x		=	NA	5.20E-10	/[	4.00E-05	x	1000	]=	1.30E-08
Vanadium	5.40E-09	x		=	NA	5.40E-08	/[	1.00E-04	x	1000	]=	5.40E-07
Zinc	4.11E-09	x		=	NA	4.11E-08	/[		x	1000	]=	NA
Diethylphthalate	3.06E-11	x		=	NA	3.06E-10	/[		x	1000	]=	NA
Aroclor-1254	6.79E-13	x	5.70E-04	=	3.87E-16	6.79E-12	/[		x	1000	]=	NA
			Pathway total =		8.13E-11					Pathway total =		1.02E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.49E-08	x	1.50E+00	=	3.73E-08	2.49E-07	/	3.00E-04	=	8.29E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	2.14E-11	x		=	NA	2.14E-10	/	2.50E-05	=	8.55E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	7.51E-09	x		=	NA	7.51E-08	/	8.00E-01	=	9.39E-08
Aroclor-1254	2.33E-10	x	2.00E+00	=	4.66E-10	2.33E-09	/	2.00E-05	=	1.17E-04
			Pathway total =		3.78E-08			Pathway total =		9.54E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Arsenic	Sum of all pathways	=	2.59E-07	Sum of all pathways	=	5.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Cadmium	Sum of all pathways	=	1.57E-14	Sum of all pathways	=	4.7E-05
Chromium	Sum of all pathways	=	7.22E-11	Sum of all pathways	=	1.3E-03
Cobalt	Sum of all pathways	=	7.37E-12	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-03
Nickel	Sum of all pathways	=	2.54E-13	Sum of all pathways	=	2.1E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-05
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-07
Aroclor-1254	Sum of all pathways	=	1.06E-09	Sum of all pathways	=	2.7E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.60E-07	All Pathways and Chemicals	=	4.42E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.75E-04	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	2.84E-08	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	8.36E-07	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.90E-06	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	1.59E-08	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	5.92E-09	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	5.05E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	4.34E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	7.14E-07	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	9.03E-08	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	1.13E-03	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	4.77E-07	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.77E-05	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	2.00E-10	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	5.13E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	6.86E-07	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	8.32E-08	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	3.16E-09	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.76E-06	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	3.34E-08	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	3.10E-06	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	2.02E-06	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	3.18E-09	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.75E-03	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	2.84E-07	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	8.36E-06	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.90E-05	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	1.59E-07	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	5.92E-08	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	5.05E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	4.34E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	7.14E-06	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	9.03E-07	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	1.13E-02	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	4.77E-06	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.77E-04	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	2.00E-09	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	5.13E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	6.86E-06	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	8.32E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	3.16E-08	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.76E-05	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	3.34E-07	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	3.10E-05	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	2.02E-05	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	3.18E-08	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.57E-07	=	[	1.3E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	6.49E-11	=	[	9.9E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	1.91E-09	=	[	2.9E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	8.90E-09	=	[	1.4E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	3.63E-11	=	[	5.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	1.35E-11	=	[	2.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.15E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	9.91E-10	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.63E-09	=	[	2.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	2.06E-10	=	[	3.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.58E-06	=	[	3.9E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	1.09E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	4.04E-08	=	[	6.2E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	4.56E-13	=	[	6.9E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.17E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	1.57E-09	=	[	2.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	1.90E-10	=	[	2.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	7.21E-12	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	4.03E-09	=	[	6.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	7.62E-11	=	[	1.2E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	7.07E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.60E-09	=	[	7.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.27E-12	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.57E-06	=	[	1.3E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	6.49E-10	=	[	9.9E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	1.91E-08	=	[	2.9E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	8.90E-08	=	[	1.4E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	3.63E-10	=	[	5.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	1.35E-10	=	[	2.1E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.15E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	9.91E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.63E-08	=	[	2.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	2.06E-09	=	[	3.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.58E-05	=	[	3.9E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	1.09E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	4.04E-07	=	[	6.2E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	4.56E-12	=	[	6.9E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.17E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	1.57E-08	=	[	2.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	1.90E-09	=	[	2.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	7.21E-11	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	4.03E-08	=	[	6.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	7.62E-10	=	[	1.2E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	7.07E-08	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.60E-08	=	[	7.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	7.27E-11	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	1.41E-07	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	3.31E-11	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	1.78E-09	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	1.41E-06	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	3.31E-10	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	1.78E-08	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization
Youth Trespasse Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.75E-04	x	0.00E+00	=	0.00E+00	3.75E-03	/	1.00E+00	=	3.75E-03
Antimony	2.84E-08	x	0.00E+00	=	0.00E+00	2.84E-07	/	4.00E-04	=	7.11E-04
Arsenic	8.36E-07	x	1.50E+00	=	1.25E-06	8.36E-06	/	3.00E-04	=	2.79E-02
Barium	3.90E-06	x	0.00E+00	=	0.00E+00	3.90E-05	/	2.00E-01	=	1.95E-04
Beryllium	1.59E-08	x	0.00E+00	=	0.00E+00	1.59E-07	/	2.00E-03	=	7.95E-05
Cadmium	5.92E-09	x	0.00E+00	=	0.00E+00	5.92E-08	/	1.00E-03	=	5.92E-05
Chromium	5.05E-07	x	0.00E+00	=	0.00E+00	5.05E-06	/	3.00E-03	=	1.68E-03
Cobalt	4.34E-07	x	0.00E+00	=	0.00E+00	4.34E-06	/	3.00E-04	=	1.45E-02
Copper	7.14E-07	x	0.00E+00	=	0.00E+00	7.14E-06	/	4.00E-02	=	1.79E-04
Fluoride	9.03E-08	x	0.00E+00	=	0.00E+00	9.03E-07	/	4.00E-02	=	2.26E-05
Iron	1.13E-03	x	0.00E+00	=	0.00E+00	1.13E-02	/	7.00E-01	=	1.61E-02
Lithium	4.77E-07	x	0.00E+00	=	0.00E+00	4.77E-06	/	2.00E-03	=	2.39E-03
Manganese	1.77E-05	x	0.00E+00	=	0.00E+00	1.77E-04	/	1.40E-01	=	1.27E-03
Mercury	2.00E-10	x	0.00E+00	=	0.00E+00	2.00E-09	/	0.00E+00	=	NA
Nickel	5.13E-07	x	0.00E+00	=	0.00E+00	5.13E-06	/	2.00E-02	=	2.56E-04
Nitrate	6.86E-07	x	0.00E+00	=	0.00E+00	6.86E-06	/	1.60E+00	=	4.29E-06
Nitrite	8.32E-08	x	0.00E+00	=	0.00E+00	8.32E-07	/	1.00E-01	=	8.32E-06
Silver	3.16E-09	x	0.00E+00	=	0.00E+00	3.16E-08	/	5.00E-03	=	6.31E-06
Strontium	1.76E-06	x	0.00E+00	=	0.00E+00	1.76E-05	/	6.00E-01	=	2.94E-05
Total Uranium	3.34E-08	x	0.00E+00	=	0.00E+00	3.34E-07	/	3.00E-03	=	1.11E-04
Vanadium	3.10E-06	x	0.00E+00	=	0.00E+00	3.10E-05	/	5.00E-03	=	6.19E-03
Zinc	2.02E-06	x	0.00E+00	=	0.00E+00	2.02E-05	/	3.00E-01	=	6.72E-05
Butylbenzylphthalate	3.18E-09	x	1.90E-03	=	6.05E-12	3.18E-08	/	2.00E-01	=	1.59E-07
			Pathway total	=	1.25E-06			Pathway total	=	7.55E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.57E-07	x		=	NA	8.57E-06	/[	5.00E-03	x	1000	]=	1.71E-06
Antimony	6.49E-11	x		=	NA	6.49E-10	/[		x	1000	]=	NA
Arsenic	1.91E-09	x	4.30E-03	=	8.21E-12	1.91E-08	/[	1.50E-05	x	1000	]=	1.27E-06
Barium	8.90E-09	x		=	NA	8.90E-08	/[	5.00E-04	x	1000	]=	1.78E-07
Beryllium	3.63E-11	x	2.40E-03	=	8.71E-14	3.63E-10	/[	2.00E-05	x	1000	]=	1.81E-08
Cadmium	1.35E-11	x	1.80E-03	=	2.43E-14	1.35E-10	/[	1.00E-05	x	1000	]=	1.35E-08
Chromium	1.15E-09	x	8.40E-02	=	9.68E-11	1.15E-08	/[	1.00E-04	x	1000	]=	1.15E-07
Cobalt	9.91E-10	x	9.00E-03	=	8.92E-12	9.91E-09	/[	6.00E-06	x	1000	]=	1.65E-06
Copper	1.63E-09	x		=	NA	1.63E-08	/[		x	1000	]=	NA
Fluoride	2.06E-10	x		=	NA	2.06E-09	/[	1.30E-02	x	1000	]=	1.59E-10
Iron	2.58E-06	x		=	NA	2.58E-05	/[		x	1000	]=	NA
Lithium	1.09E-09	x		=	NA	1.09E-08	/[		x	1000	]=	NA
Manganese	4.04E-08	x		=	NA	4.04E-07	/[	5.00E-05	x	1000	]=	8.09E-06
Mercury	4.56E-13	x	0.00E+00	=	0.00E+00	4.56E-12	/[	3.00E-04	x	1000	]=	1.52E-11
Nickel	1.17E-09	x	2.60E-04	=	3.04E-13	1.17E-08	/[	9.00E-05	x	1000	]=	1.30E-07
Nitrate	1.57E-09	x		=	NA	1.57E-08	/[		x	1000	]=	NA
Nitrite	1.90E-10	x		=	NA	1.90E-09	/[		x	1000	]=	NA
Silver	7.21E-12	x		=	NA	7.21E-11	/[		x	1000	]=	NA
Strontium	4.03E-09	x		=	NA	4.03E-08	/[		x	1000	]=	NA
Total Uranium	7.62E-11	x		=	NA	7.62E-10	/[	4.00E-05	x	1000	]=	1.90E-08
Vanadium	7.07E-09	x		=	NA	7.07E-08	/[	1.00E-04	x	1000	]=	7.07E-07
Zinc	4.60E-09	x				4.60E-08	/[		x	1000	]=	NA
Butylbenzylphthalate	7.27E-12	x	0.00E+00	=	0.00E+00	7.27E-11	/		x	1000	]=	NA
			Pathway total =		1.14E-10					Pathway total =		1.39E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.41E-07	x	1.50E+00	=	2.11E-07	1.41E-06	/	3.00E-04	=	4.68E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.31E-11	x		=	NA	3.31E-10	/	2.50E-05	=	1.33E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.78E-09	x	1.90E-03	=	3.39E-12	1.78E-08	/	2.00E-01	=	8.91E-08
			Pathway total =		2.11E-07			Pathway total =		4.70E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-04
Arsenic	Sum of all pathways	=	1.47E-06	Sum of all pathways	=	3.3E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Beryllium	Sum of all pathways	=	8.71E-14	Sum of all pathways	=	8.0E-05
Cadmium	Sum of all pathways	=	2.43E-14	Sum of all pathways	=	7.2E-05
Chromium	Sum of all pathways	=	9.68E-11	Sum of all pathways	=	1.7E-03
Cobalt	Sum of all pathways	=	8.92E-12	Sum of all pathways	=	1.4E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-11
Nickel	Sum of all pathways	=	3.04E-13	Sum of all pathways	=	2.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-05
Butylbenzylphthalate	Sum of all pathways	=	9.44E-12	Sum of all pathways	=	2.5E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	1.47E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	8.02E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.93E-04	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	7.02E-09	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.05E-07	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.09E-06	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	6.27E-09	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Boron	1.32E-07	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	1.29E-07	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	6.79E-07	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.48E-07	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	6.51E-07	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	5.84E-08	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.55E-04	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.60E-07	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.95E-05	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	9.15E-10	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	4.89E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	1.98E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	5.52E-08	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	2.21E-08	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	3.35E-09	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.37E-06	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	3.26E-08	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.32E-06	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.77E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	2.62E-10	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	4.89E-09	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	1.33E-11	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Aldrin	7.89E-11	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.93E-03	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	7.02E-08	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.05E-06	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.09E-05	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	6.27E-08	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Boron	1.32E-06	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	1.29E-06	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	6.79E-06	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.48E-06	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	6.51E-06	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	5.84E-07	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.55E-03	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.60E-06	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.95E-04	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	9.15E-09	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	4.89E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	1.98E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	5.52E-07	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	2.21E-07	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	3.35E-08	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.37E-05	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	3.26E-07	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.32E-05	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.77E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	2.62E-09	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	4.89E-08	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	1.33E-10	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Aldrin	7.89E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	6.68E-07	=	[	1.0E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	1.60E-11	=	[	2.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	4.68E-10	=	[	7.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	7.06E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	1.43E-11	=	[	2.2E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Boron	3.01E-10	=	[	4.6E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	2.94E-10	=	[	4.5E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.55E-09	=	[	2.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	7.94E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.49E-09	=	[	2.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.33E-10	=	[	2.0E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.18E-06	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	8.22E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	4.46E-08	=	[	6.8E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	2.09E-12	=	[	3.2E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.12E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	4.52E-10	=	[	6.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	1.26E-10	=	[	1.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Selenium	5.04E-11	=	[	7.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	7.66E-12	=	[	1.2E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	3.13E-09	=	[	4.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	7.45E-11	=	[	1.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	5.30E-09	=	[	8.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.04E-09	=	[	6.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Acetone	5.97E-13	=	[	9.1E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.12E-11	=	[	1.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	3.04E-14	=	[	4.6E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Aldrin	1.80E-13	=	[	2.7E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	6.68E-06	=	[1.0E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	1.60E-10	=	[2.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	4.68E-09	=	[7.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	7.06E-08	=	[1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	1.43E-10	=	[2.2E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Boron	3.01E-09	=	[4.6E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	2.94E-09	=	[4.5E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.55E-08	=	[2.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	7.94E-09	=	[1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.49E-08	=	[2.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.33E-09	=	[2.0E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.18E-05	=	[3.3E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	8.22E-09	=	[1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	4.46E-07	=	[6.8E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	2.09E-11	=	[3.2E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.12E-08	=	[1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	4.52E-09	=	[6.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	1.26E-09	=	[1.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Selenium	5.04E-10	=	[7.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	7.66E-11	=	[1.2E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	3.13E-08	=	[4.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	7.45E-10	=	[1.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	5.30E-08	=	[8.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.04E-08	=	[6.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Acetone	5.97E-12	=	[9.1E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	1.12E-10	=	[1.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	3.04E-13	=	[4.6E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Aldrin	1.80E-12	=	[2.7E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	3.45E-08	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	7.20E-10	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	2.74E-09	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Aldrin	4.42E-11	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	3.45E-07	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	7.20E-09	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	2.74E-08	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Aldrin	4.42E-10	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.93E-04	x	0.00E+00	=	0.00E+00	2.93E-03	/	1.00E+00	=	2.93E-03
Antimony	7.02E-09	x	0.00E+00	=	0.00E+00	7.02E-08	/	4.00E-04	=	1.76E-04
Arsenic	2.05E-07	x	1.50E+00	=	3.08E-07	2.05E-06	/	3.00E-04	=	6.84E-03
Barium	3.09E-06	x	0.00E+00	=	0.00E+00	3.09E-05	/	2.00E-01	=	1.55E-04
Beryllium	6.27E-09	x	0.00E+00	=	0.00E+00	6.27E-08	/	2.00E-03	=	3.14E-05
Boron	1.32E-07	x	0.00E+00	=	0.00E+00	1.32E-06	/	2.00E-01	=	6.59E-06
Cadmium	1.29E-07	x	0.00E+00	=	0.00E+00	1.29E-06	/	1.00E-03	=	1.29E-03
Chromium	6.79E-07	x	0.00E+00	=	0.00E+00	6.79E-06	/	3.00E-03	=	2.26E-03
Cobalt	3.48E-07	x	0.00E+00	=	0.00E+00	3.48E-06	/	3.00E-04	=	1.16E-02
Copper	6.51E-07	x	0.00E+00	=	0.00E+00	6.51E-06	/	4.00E-02	=	1.63E-04
Fluoride	5.84E-08	x	0.00E+00	=	0.00E+00	5.84E-07	/	4.00E-02	=	1.46E-05
Iron	9.55E-04	x	0.00E+00	=	0.00E+00	9.55E-03	/	7.00E-01	=	1.36E-02
Lithium	3.60E-07	x	0.00E+00	=	0.00E+00	3.60E-06	/	2.00E-03	=	1.80E-03
Manganese	1.95E-05	x	0.00E+00	=	0.00E+00	1.95E-04	/	1.40E-01	=	1.39E-03
Mercury	9.15E-10	x	0.00E+00	=	0.00E+00	9.15E-09	/	0.00E+00	=	NA
Nickel	4.89E-07	x	0.00E+00	=	0.00E+00	4.89E-06	/	2.00E-02	=	2.45E-04
Nitrate	1.98E-07	x	0.00E+00	=	0.00E+00	1.98E-06	/	1.60E+00	=	1.24E-06
Nitrite	5.52E-08	x	0.00E+00	=	0.00E+00	5.52E-07	/	1.00E-01	=	5.52E-06
Selenium	2.21E-08	x	0.00E+00	=	0.00E+00	2.21E-07	/	5.00E-03	=	4.42E-05
Silver	3.35E-09	x	0.00E+00	=	0.00E+00	3.35E-08	/	5.00E-03	=	6.71E-06
Strontium	1.37E-06	x	0.00E+00	=	0.00E+00	1.37E-05	/	6.00E-01	=	2.28E-05
Total Uranium	3.26E-08	x	0.00E+00	=	0.00E+00	3.26E-07	/	3.00E-03	=	1.09E-04
Vanadium	2.32E-06	x	0.00E+00	=	0.00E+00	2.32E-05	/	5.00E-03	=	4.64E-03
Zinc	1.77E-06	x	0.00E+00	=	0.00E+00	1.77E-05	/	3.00E-01	=	5.89E-05
Acetone	2.62E-10	x	0.00E+00	=	0.00E+00	2.62E-09	/	9.00E-01	=	2.91E-09
Butylbenzylphthalate	4.89E-09	x	1.90E-03	=	9.29E-12	4.89E-08	/	2.00E-01	=	2.45E-07
Toluene	1.33E-11	x	0.00E+00	=	0.00E+00	1.33E-10	/	8.00E-02	=	1.66E-09
Aldrin	7.89E-11	x	1.70E+01	=	1.34E-09	7.89E-10	/	3.00E-05	=	2.63E-05
			Pathway total	=	3.09E-07			Pathway total	=	4.75E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	6.68E-07	x		=	NA	6.68E-06	/[	5.00E-03	x	1000	]=	1.34E-06
Antimony	1.60E-11	x		=	NA	1.60E-10	/[		x	1000	]=	NA
Arsenic	4.68E-10	x	4.30E-03	=	2.01E-12	4.68E-09	/[	1.50E-05	x	1000	]=	3.12E-07
Barium	7.06E-09	x		=	NA	7.06E-08	/[	5.00E-04	x	1000	]=	1.41E-07
Beryllium	1.43E-11	x	2.40E-03	=	3.44E-14	1.43E-10	/[	2.00E-05	x	1000	]=	7.16E-09
Boron	3.01E-10	x	0.00E+00	=	0.00E+00	3.01E-09	/[	2.00E-02	x	1000	]=	1.50E-10
Cadmium	2.94E-10	x	1.80E-03	=	5.29E-13	2.94E-09	/[	1.00E-05	x	1001	]=	2.93E-07
Chromium	1.55E-09	x	8.40E-02	=	1.30E-10	1.55E-08	/[	1.00E-04	x	1002	]=	1.55E-07
Cobalt	7.94E-10	x	9.00E-03	=	7.15E-12	7.94E-09	/[	6.00E-06	x	1003	]=	1.32E-06
Copper	1.49E-09	x		=	NA	1.49E-08	/[		x	1004	]=	NA
Fluoride	1.33E-10	x		=	NA	1.33E-09	/[	1.30E-02	x	1005	]=	1.02E-10
Iron	2.18E-06	x		=	NA	2.18E-05	/[		x	1000	]=	NA
Lithium	8.22E-10	x		=	NA	8.22E-09	/[		x	1000	]=	NA
Manganese	4.46E-08	x		=	NA	4.46E-07	/[	5.00E-05	x	1000	]=	8.92E-06
Mercury	2.09E-12	x	0.00E+00	=	0.00E+00	2.09E-11	/[	3.00E-04	x	1000	]=	6.97E-11
Nickel	1.12E-09	x	2.60E-04	=	2.90E-13	1.12E-08	/[	9.00E-05	x	1000	]=	1.24E-07
Nitrate	4.52E-10	x		=	NA	4.52E-09	/[		x	1000	]=	NA
Nitrite	1.26E-10	x		=	NA	1.26E-09	/[		x	1000	]=	NA
Selenium	5.04E-11	x	0.00E+00	=	0.00E+00	5.04E-10	/[	2.00E-02	x	1000	]=	2.52E-11
Silver	7.66E-12	x		=	NA	7.66E-11	/[		x	1000	]=	NA
Strontium	3.13E-09	x		=	NA	3.13E-08	/[		x	1000	]=	NA
Total Uranium	7.45E-11	x		=	NA	7.45E-10	/[	4.00E-05	x	1000	]=	1.86E-08
Vanadium	5.30E-09	x		=	NA	5.30E-08	/[	1.00E-04	x	1000	]=	5.30E-07
Zinc	4.04E-09	x		=	NA	4.04E-08	/[		x	1000	]=	NA
Acetone	5.97E-13	x	0.00E+00	=	0.00E+00	5.97E-12	/[	3.10E+01	x	1000	]=	1.93E-16
Butylbenzylphthalate	1.12E-11	x	0.00E+00	=	0.00E+00	1.12E-10	/[		x	1000	]=	NA
Toluene	3.04E-14	x	0.00E+00	=	0.00E+00	3.04E-13	/[	5.00E+00	x	1000	]=	6.07E-17
Aldrin	1.80E-13	x	4.90E-03	=	8.83E-16	1.80E-12	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.40E-10					Pathway total =		1.32E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.45E-08	x	1.50E+00	=	5.17E-08	3.45E-07	/	3.00E-04	=	1.15E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	7.20E-10	x		=	NA	7.20E-09	/	2.50E-05	=	2.88E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	2.74E-09	x	1.90E-03	=	5.21E-12	2.74E-08	/	2.00E-01	=	1.37E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	4.42E-11	x	1.70E+01	=	7.51E-10	4.42E-10	/	3.00E-05	=	1.47E-05
			Pathway total =		5.25E-08			Pathway total =		1.45E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Arsenic	Sum of all pathways	=	3.59E-07	Sum of all pathways	=	8.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Beryllium	Sum of all pathways	=	3.44E-14	Sum of all pathways	=	3.1E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-06
Cadmium	Sum of all pathways	=	5.29E-13	Sum of all pathways	=	1.6E-03
Chromium	Sum of all pathways	=	1.30E-10	Sum of all pathways	=	2.3E-03
Cobalt	Sum of all pathways	=	7.15E-12	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-11
Nickel	Sum of all pathways	=	2.90E-13	Sum of all pathways	=	2.4E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-09
Butylbenzylphthalate	Sum of all pathways	=	1.45E-11	Sum of all pathways	=	3.8E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-09
Aldrin	Sum of all pathways	=	2.09E-09	Sum of all pathways	=	4.1E-05

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.62E-07	All Pathways and Chemicals	=	4.89E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.67E-04	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	9.75E-09	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	1.38E-07	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.71E-06	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	1.18E-08	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	4.60E-09	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	3.54E-07	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.23E-07	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.14E-07	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	8.33E-08	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.45E-04	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	2.93E-07	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.52E-05	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	1.20E-09	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	4.44E-07	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	2.82E-07	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	1.21E-07	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	3.23E-09	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.43E-06	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Tin	2.51E-07	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.82E-08	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.75E-06	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.51E-06	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
2-Butanone	9.80E-11	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.59E-07	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	2.34E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Hexane	1.42E-09	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	7.89E-11	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
o-Xylene	5.05E-12	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	2.58E-11	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	3.86E-11	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Xylenes (total)	1.83E-11	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	9.96E-10	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Gamma-BHC (Lindane)	2.01E-10	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1260	8.13E-10	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.67E-03	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	9.75E-08	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	1.38E-06	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.71E-05	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	1.18E-07	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	4.60E-08	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	3.54E-06	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.23E-06	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.14E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	8.33E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.45E-03	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	2.93E-06	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.52E-04	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	1.20E-08	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	4.44E-06	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	2.82E-06	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	1.21E-06	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	3.23E-08	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.43E-05	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Tin	2.51E-06	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.82E-07	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.75E-05	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.51E-05	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
2-Butanone	9.80E-10	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	1.59E-06	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	2.34E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Hexane	1.42E-08	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	7.89E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
o-Xylene	5.05E-11	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	2.58E-10	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	3.86E-10	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Xylenes (total)	1.83E-10	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	9.96E-09	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Gamma-BHC (Lindane)	2.01E-09	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1260	8.13E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	6.09E-07	=	[	9.3E-05	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.23E-11	=	[	3.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	3.14E-10	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	8.48E-09	=	[	1.3E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	2.68E-11	=	[	4.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	1.05E-11	=	[	1.6E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	8.09E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	7.37E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.17E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.90E-10	=	[	2.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.16E-06	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	6.69E-10	=	[	1.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.48E-08	=	[	5.3E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	2.74E-12	=	[	4.2E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.01E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	6.44E-10	=	[	9.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	2.76E-10	=	[	4.2E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	7.37E-12	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	3.26E-09	=	[	5.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Tin	5.73E-10	=	[	8.7E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	6.44E-11	=	[	9.8E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	6.28E-09	=	[	9.6E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	3.45E-09	=	[	5.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
2-Butanone	2.24E-13	=	[	3.4E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	3.63E-10	=	[	5.5E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	5.34E-12	=	[	8.1E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Hexane	3.23E-12	=	[	4.9E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Methylene chloride	1.80E-13	=	[	2.7E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
o-Xylene	1.15E-14	=	[	1.8E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Styrene	5.89E-14	=	[	9.0E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	8.81E-14	=	[	1.3E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Xylenes (total)	4.17E-14	=	[	6.3E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
beta-BHC	2.27E-12	=	[	3.5E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	4.59E-13	=	[	7.0E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Aroclor-1260	1.86E-12	=	[	2.8E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.09E-06	=	[	9.3E-05	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.23E-10	=	[	3.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	3.14E-09	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	8.48E-08	=	[	1.3E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	2.68E-10	=	[	4.1E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	1.05E-10	=	[	1.6E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	8.09E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	7.37E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.17E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.90E-09	=	[	2.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.16E-05	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	6.69E-09	=	[	1.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.48E-07	=	[	5.3E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	2.74E-11	=	[	4.2E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.01E-08	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	6.44E-09	=	[	9.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	2.76E-09	=	[	4.2E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	7.37E-11	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	3.26E-08	=	[	5.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Tin	5.73E-09	=	[	8.7E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	6.44E-10	=	[	9.8E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	6.28E-08	=	[	9.6E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	3.45E-08	=	[	5.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
2-Butanone	2.24E-12	=	[	3.4E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Bis(2-ethylhexyl) phthalate	3.63E-09	=	[	5.5E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	5.34E-11	=	[	8.1E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Hexane	3.23E-11	=	[	4.9E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Methylene chloride	1.80E-12	=	[	2.7E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
o-Xylene	1.15E-13	=	[	1.8E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Styrene	5.89E-13	=	[	9.0E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	8.81E-13	=	[	1.3E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Xylenes (total)	4.17E-13	=	[	6.3E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
beta-BHC	2.27E-11	=	[	3.5E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Gamma-BHC (Lindane)	4.59E-12	=	[	7.0E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Aroclor-1260	1.86E-11	=	[	2.8E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.31E-08	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	2.57E-11	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	8.91E-08	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	1.31E-09	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	5.58E-10	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Gamma-BHC (Lindane)	4.51E-11	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1260	6.37E-10	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.31E-07	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	2.57E-10	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	8.91E-07	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	1.31E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	5.58E-09	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Gamma-BHC (Lindane)	4.51E-10	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1260	6.37E-09	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.67E-04	x	0.00E+00	=	0.00E+00	2.67E-03	/	1.00E+00	=	2.67E-03
Antimony	9.75E-09	x	0.00E+00	=	0.00E+00	9.75E-08	/	4.00E-04	=	2.44E-04
Arsenic	1.38E-07	x	1.50E+00	=	2.06E-07	1.38E-06	/	3.00E-04	=	4.59E-03
Barium	3.71E-06	x	0.00E+00	=	0.00E+00	3.71E-05	/	2.00E-01	=	1.86E-04
Beryllium	1.18E-08	x	0.00E+00	=	0.00E+00	1.18E-07	/	2.00E-03	=	5.88E-05
Cadmium	4.60E-09	x	0.00E+00	=	0.00E+00	4.60E-08	/	1.00E-03	=	4.60E-05
Chromium	3.54E-07	x	0.00E+00	=	0.00E+00	3.54E-06	/	3.00E-03	=	1.18E-03
Cobalt	3.23E-07	x	0.00E+00	=	0.00E+00	3.23E-06	/	3.00E-04	=	1.08E-02
Copper	5.14E-07	x	0.00E+00	=	0.00E+00	5.14E-06	/	4.00E-02	=	1.29E-04
Fluoride	8.33E-08	x	0.00E+00	=	0.00E+00	8.33E-07	/	4.00E-02	=	2.08E-05
Iron	9.45E-04	x	0.00E+00	=	0.00E+00	9.45E-03	/	7.00E-01	=	1.35E-02
Lithium	2.93E-07	x	0.00E+00	=	0.00E+00	2.93E-06	/	2.00E-03	=	1.47E-03
Manganese	1.52E-05	x	0.00E+00	=	0.00E+00	1.52E-04	/	1.40E-01	=	1.09E-03
Mercury	1.20E-09	x	0.00E+00	=	0.00E+00	1.20E-08	/	0.00E+00	=	NA
Nickel	4.44E-07	x	0.00E+00	=	0.00E+00	4.44E-06	/	2.00E-02	=	2.22E-04
Nitrate	2.82E-07	x	0.00E+00	=	0.00E+00	2.82E-06	/	1.60E+00	=	1.76E-06
Nitrite	1.21E-07	x	0.00E+00	=	0.00E+00	1.21E-06	/	1.00E-01	=	1.21E-05
Silver	3.23E-09	x	0.00E+00	=	0.00E+00	3.23E-08	/	5.00E-03	=	6.45E-06
Strontium	1.43E-06	x	0.00E+00	=	0.00E+00	1.43E-05	/	6.00E-01	=	2.38E-05
Tin	2.51E-07	x	0.00E+00	=	0.00E+00	2.51E-06	/	6.00E-01	=	4.18E-06
Total Uranium	2.82E-08	x	0.00E+00	=	0.00E+00	2.82E-07	/	3.00E-03	=	9.41E-05
Vanadium	2.75E-06	x	0.00E+00	=	0.00E+00	2.75E-05	/	5.00E-03	=	5.50E-03
Zinc	1.51E-06	x	0.00E+00	=	0.00E+00	1.51E-05	/	3.00E-01	=	5.04E-05
2-Butanone	9.80E-11	x	0.00E+00	=	0.00E+00	9.80E-10	/	6.00E-01	=	1.63E-09
Bis(2-ethylhexyl) phthalate	1.59E-07	x	1.40E-02	=	2.23E-09	1.59E-06	/	2.00E-02	=	7.95E-05
Butylbenzylphthalate	2.34E-09	x	1.90E-03	=	4.44E-12	2.34E-08	/	2.00E-01	=	1.17E-07
Hexane	1.42E-09	x	0.00E+00	=	0.00E+00	1.42E-08	/	6.00E-02	=	2.36E-07
Methylene chloride	7.89E-11	x	2.00E-03	=	1.58E-13	7.89E-10	/	6.00E-03	=	1.32E-07
o-Xylene	5.05E-12	x	0.00E+00	=	0.00E+00	5.05E-11	/	2.00E-01	=	2.52E-10
Styrene	2.58E-11	x	0.00E+00	=	0.00E+00	2.58E-10	/	2.00E-01	=	1.29E-09
Toluene	3.86E-11	x	0.00E+00	=	0.00E+00	3.86E-10	/	8.00E-02	=	4.82E-09
Xylenes (total)	1.83E-11	x	0.00E+00	=	0.00E+00	1.83E-10	/	2.00E-01	=	9.13E-10
beta-BHC	9.96E-10	x	1.80E+00	=	1.79E-09	9.96E-09	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	2.01E-10	x	1.10E+00	=	2.21E-10	2.01E-09	/	3.00E-04	=	6.71E-06
Aroclor-1260	8.13E-10	x	2.00E+00	=	1.63E-09	8.13E-09	/	0.00E+00	=	NA
			Pathway total	=	2.12E-07			Pathway total	=	4.19E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	6.09E-07	x		=	NA	6.09E-06	/[	5.00E-03	x	1000	]=	1.22E-06
Antimony	2.23E-11	x		=	NA	2.23E-10	/[		x	1000	]=	NA
Arsenic	3.14E-10	x	4.30E-03	=	1.35E-12	3.14E-09	/[	1.50E-05	x	1000	]=	2.09E-07
Barium	8.48E-09	x		=	NA	8.48E-08	/[	5.00E-04	x	1000	]=	1.70E-07
Beryllium	2.68E-11	x	2.40E-03	=	6.44E-14	2.68E-10	/[	2.00E-05	x	1000	]=	1.34E-08
Cadmium	1.05E-11	x	1.80E-03	=	1.89E-14	1.05E-10	/[	1.00E-05	x	1000	]=	1.05E-08
Chromium	8.09E-10	x	8.40E-02	=	6.79E-11	8.09E-09	/[	1.00E-04	x	1000	]=	8.09E-08
Cobalt	7.37E-10	x	9.00E-03	=	6.63E-12	7.37E-09	/[	6.00E-06	x	1000	]=	1.23E-06
Copper	1.17E-09	x		=	NA	1.17E-08	/[		x	1000	]=	NA
Fluoride	1.90E-10	x		=	NA	1.90E-09	/[	1.30E-02	x	1000	]=	1.46E-10
Iron	2.16E-06	x		=	NA	2.16E-05	/[		x	1000	]=	NA
Lithium	6.69E-10	x		=	NA	6.69E-09	/[		x	1000	]=	NA
Manganese	3.48E-08	x		=	NA	3.48E-07	/[	5.00E-05	x	1000	]=	6.96E-06
Mercury	2.74E-12	x	0.00E+00	=	0.00E+00	2.74E-11	/[	3.00E-04	x	1000	]=	9.13E-11
Nickel	1.01E-09	x	2.60E-04	=	2.64E-13	1.01E-08	/[	9.00E-05	x	1000	]=	1.13E-07
Nitrate	6.44E-10	x		=	NA	6.44E-09	/[		x	1000	]=	NA
Nitrite	2.76E-10	x		=	NA	2.76E-09	/[		x	1000	]=	NA
Silver	7.37E-12	x		=	NA	7.37E-11	/[		x	1000	]=	NA
Strontium	3.26E-09	x		=	NA	3.26E-08	/[		x	1000	]=	NA
Tin	5.73E-10	x		=	NA	5.73E-09	/[		x	1000	]=	NA
Total Uranium	6.44E-11	x		=	NA	6.44E-10	/[	4.00E-05	x	1000	]=	1.61E-08
Vanadium	6.28E-09	x		=	NA	6.28E-08	/[	1.00E-04	x	1000	]=	6.28E-07
Zinc	3.45E-09	x		=	NA	3.45E-08	/[		x	1000	]=	NA
2-Butanone	2.24E-13	x	0.00E+00	=	0.00E+00	2.24E-12	/[	5.00E+00	x	1000	]=	4.48E-16
Bis(2-ethylhexyl) phthalate	3.63E-10	x	2.40E-06	=	8.72E-16	3.63E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	5.34E-12	x	0.00E+00	=	0.00E+00	5.34E-11	/[		x	1000	]=	NA
Hexane	3.23E-12	x	0.00E+00	=	0.00E+00	3.23E-11	/[	7.00E-01	x	1000	]=	4.62E-14
Methylene chloride	1.80E-13	x	1.00E-08	=	1.80E-21	1.80E-12	/[	6.00E-01	x	1000	]=	3.00E-15
o-Xylene	1.15E-14	x	0.00E+00	=	0.00E+00	1.15E-13	/[	1.00E-01	x	1000	]=	1.15E-15
Styrene	5.89E-14	x	0.00E+00	=	0.00E+00	5.89E-13	/[	1.00E+00	x	1000	]=	5.89E-16
Toluene	8.81E-14	x	0.00E+00	=	0.00E+00	8.81E-13	/[	5.00E+00	x	1000	]=	1.76E-16
Xylenes (total)	4.17E-14	x	0.00E+00	=	0.00E+00	4.17E-13	/[	1.00E-01	x	1000	]=	4.17E-15
beta-BHC	2.27E-12	x	5.30E-04	=	1.20E-15	2.27E-11	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	4.59E-13	x	3.10E-04	=	1.42E-16	4.59E-12	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.86E-12	x	5.70E-04	=	1.06E-15	1.86E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		7.63E-11					Pathway total =		1.06E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.31E-08	x	1.50E+00	=	3.47E-08	2.31E-07	/	3.00E-04	=	7.71E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.57E-11	x		=	NA	2.57E-10	/	2.50E-05	=	1.03E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	8.91E-08	x	1.40E-02	=	1.25E-09	8.91E-07	/	2.00E-02	=	4.45E-05
Butylbenzylphthalate	1.31E-09	x	1.90E-03	=	2.49E-12	1.31E-08	/	2.00E-01	=	6.54E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	5.58E-10	x	1.80E+00	=	1.00E-09	5.58E-09	/		=	NA
Gamma-BHC (Lindane)	4.51E-11	x	1.10E+00	=	4.96E-11	4.51E-10	/	3.00E-04	=	1.50E-06
Aroclor-1260	6.37E-10	x	2.00E+00	=	1.27E-09	6.37E-09	/		=	NA
			Pathway total =		3.83E-08			Pathway total =		8.27E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Arsenic	Sum of all pathways	=	2.41E-07	Sum of all pathways	=	5.4E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Beryllium	Sum of all pathways	=	6.44E-14	Sum of all pathways	=	5.9E-05
Cadmium	Sum of all pathways	=	1.89E-14	Sum of all pathways	=	5.6E-05
Chromium	Sum of all pathways	=	6.79E-11	Sum of all pathways	=	1.2E-03
Cobalt	Sum of all pathways	=	6.63E-12	Sum of all pathways	=	1.1E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-11
Nickel	Sum of all pathways	=	2.64E-13	Sum of all pathways	=	2.2E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-05
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	3.47E-09	Sum of all pathways	=	1.2E-04
Butylbenzylphthalate	Sum of all pathways	=	6.93E-12	Sum of all pathways	=	1.8E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-07
Methylene chloride	Sum of all pathways	=	1.58E-13	Sum of all pathways	=	1.3E-07
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-10
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-09
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-10
beta-BHC	Sum of all pathways	=	2.80E-09	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	2.71E-10	Sum of all pathways	=	8.2E-06
Aroclor-1260	Sum of all pathways	=	2.90E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.51E-07	All Pathways and Chemicals	=	4.28E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.76E-04	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	1.01E-08	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	1.98E-07	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.57E-06	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	7.84E-09	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	5.42E-09	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	6.63E-07	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	4.02E-07	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	4.81E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	6.54E-08	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	1.03E-03	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	2.98E-07	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.61E-05	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	7.89E-08	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	5.16E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	1.28E-06	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	5.13E-08	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	3.88E-08	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	2.58E-09	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.32E-06	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.15E-08	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.61E-06	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.77E-06	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	7.89E-09	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Di-n-butylphthalate	2.25E-08	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	1.55E-11	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	2.44E-11	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.76E-03	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	1.01E-07	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	1.98E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.57E-05	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	7.84E-08	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	5.42E-08	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	6.63E-06	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	4.02E-06	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	4.81E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	6.54E-07	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	1.03E-02	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	2.98E-06	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.61E-04	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	7.89E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	5.16E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	1.28E-05	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	5.13E-07	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	3.88E-07	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	2.58E-08	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.32E-05	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.15E-07	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.61E-05	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.77E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	7.89E-08	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Di-n-butylphthalate	2.25E-07	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	1.55E-10	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	2.44E-10	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	6.31E-07	=	[	9.6E-05	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.30E-11	=	[	3.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	4.52E-10	=	[	6.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	8.15E-09	=	[	1.2E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	1.79E-11	=	[	2.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	1.24E-11	=	[	1.9E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.51E-09	=	[	2.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	9.17E-10	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.10E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.49E-10	=	[	2.3E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.35E-06	=	[	3.6E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	6.81E-10	=	[	1.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.68E-08	=	[	5.6E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Molybdenum	1.80E-10	=	[	2.7E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.18E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	2.92E-09	=	[	4.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	1.17E-10	=	[	1.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Selenium	8.85E-11	=	[	1.3E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	5.90E-12	=	[	9.0E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	3.01E-09	=	[	4.6E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	4.91E-11	=	[	7.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	5.96E-09	=	[	9.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.03E-09	=	[	6.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.80E-11	=	[	2.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	5.13E-11	=	[	7.8E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Styrene	3.55E-14	=	[	5.4E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	5.57E-14	=	[	8.5E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	6.31E-06	=	[	9.6E-05	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.30E-10	=	[	3.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	4.52E-09	=	[	6.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	8.15E-08	=	[	1.2E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	1.79E-10	=	[	2.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	1.24E-10	=	[	1.9E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.51E-08	=	[	2.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	9.17E-09	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.10E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.49E-09	=	[	2.3E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.35E-05	=	[	3.6E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	6.81E-09	=	[	1.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.68E-07	=	[	5.6E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Molybdenum	1.80E-09	=	[	2.7E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.18E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	2.92E-08	=	[	4.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	1.17E-09	=	[	1.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Selenium	8.85E-10	=	[	1.3E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	5.90E-11	=	[	9.0E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	3.01E-08	=	[	4.6E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	4.91E-10	=	[	7.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	5.96E-08	=	[	9.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.03E-08	=	[	6.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	1.80E-10	=	[	2.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Di-n-butylphthalate	5.13E-10	=	[	7.8E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Styrene	3.55E-13	=	[	5.4E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	5.57E-13	=	[	8.5E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	3.33E-08	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	3.04E-11	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	4.42E-09	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Di-n-butylphthalate	1.26E-08	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	3.33E-07	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	3.04E-10	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	4.42E-08	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Di-n-butylphthalate	1.26E-07	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.76E-04	x	0.00E+00	=	0.00E+00	2.76E-03	/	1.00E+00	=	2.76E-03
Antimony	1.01E-08	x	0.00E+00	=	0.00E+00	1.01E-07	/	4.00E-04	=	2.52E-04
Arsenic	1.98E-07	x	1.50E+00	=	2.97E-07	1.98E-06	/	3.00E-04	=	6.60E-03
Barium	3.57E-06	x	0.00E+00	=	0.00E+00	3.57E-05	/	2.00E-01	=	1.78E-04
Beryllium	7.84E-09	x	0.00E+00	=	0.00E+00	7.84E-08	/	2.00E-03	=	3.92E-05
Cadmium	5.42E-09	x	0.00E+00	=	0.00E+00	5.42E-08	/	1.00E-03	=	5.42E-05
Chromium	6.63E-07	x	0.00E+00	=	0.00E+00	6.63E-06	/	3.00E-03	=	2.21E-03
Cobalt	4.02E-07	x	0.00E+00	=	0.00E+00	4.02E-06	/	3.00E-04	=	1.34E-02
Copper	4.81E-07	x	0.00E+00	=	0.00E+00	4.81E-06	/	4.00E-02	=	1.20E-04
Fluoride	6.54E-08	x	0.00E+00	=	0.00E+00	6.54E-07	/	4.00E-02	=	1.63E-05
Iron	1.03E-03	x	0.00E+00	=	0.00E+00	1.03E-02	/	7.00E-01	=	1.47E-02
Lithium	2.98E-07	x	0.00E+00	=	0.00E+00	2.98E-06	/	2.00E-03	=	1.49E-03
Manganese	1.61E-05	x	0.00E+00	=	0.00E+00	1.61E-04	/	1.40E-01	=	1.15E-03
Molybdenum	7.89E-08	x	0.00E+00	=	0.00E+00	7.89E-07	/	5.00E-03	=	1.58E-04
Nickel	5.16E-07	x	0.00E+00	=	0.00E+00	5.16E-06	/	2.00E-02	=	2.58E-04
Nitrate	1.28E-06	x	0.00E+00	=	0.00E+00	1.28E-05	/	1.60E+00	=	8.00E-06
Nitrite	5.13E-08	x	0.00E+00	=	0.00E+00	5.13E-07	/	1.00E-01	=	5.13E-06
Selenium	3.88E-08	x	0.00E+00	=	0.00E+00	3.88E-07	/	5.00E-03	=	7.75E-05
Silver	2.58E-09	x	0.00E+00	=	0.00E+00	2.58E-08	/	5.00E-03	=	5.17E-06
Strontium	1.32E-06	x	0.00E+00	=	0.00E+00	1.32E-05	/	6.00E-01	=	2.20E-05
Total Uranium	2.15E-08	x	0.00E+00	=	0.00E+00	2.15E-07	/	3.00E-03	=	7.17E-05
Vanadium	2.61E-06	x	0.00E+00	=	0.00E+00	2.61E-05	/	5.00E-03	=	5.22E-03
Zinc	1.77E-06	x	0.00E+00	=	0.00E+00	1.77E-05	/	3.00E-01	=	5.89E-05
Butylbenzylphthalate	7.89E-09	x	1.90E-03	=	1.50E-11	7.89E-08	/	2.00E-01	=	3.95E-07
Di-n-butylphthalate	2.25E-08	x	0.00E+00	=	0.00E+00	2.25E-07	/	1.00E-01	=	2.25E-06
Styrene	1.55E-11	x	0.00E+00	=	0.00E+00	1.55E-10	/	2.00E-01	=	7.77E-10
Toluene	2.44E-11	x	0.00E+00	=	0.00E+00	2.44E-10	/	8.00E-02	=	3.05E-09
			Pathway total	=	2.97E-07			Pathway total	=	4.89E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	6.31E-07	x		=	NA	6.31E-06	/[	5.00E-03	x	1000	]=	1.26E-06
Antimony	2.30E-11	x		=	NA	2.30E-10	/[		x	1000	]=	NA
Arsenic	4.52E-10	x	4.30E-03	=	1.94E-12	4.52E-09	/[	1.50E-05	x	1000	]=	3.01E-07
Barium	8.15E-09	x		=	NA	8.15E-08	/[	5.00E-04	x	1000	]=	1.63E-07
Beryllium	1.79E-11	x	2.40E-03	=	4.30E-14	1.79E-10	/[	2.00E-05	x	1001	]=	8.94E-09
Cadmium	1.24E-11	x	1.80E-03	=	2.23E-14	1.24E-10	/[	1.00E-05	x	1002	]=	1.24E-08
Chromium	1.51E-09	x	8.40E-02	=	1.27E-10	1.51E-08	/[	1.00E-04	x	1003	]=	1.51E-07
Cobalt	9.17E-10	x	9.00E-03	=	8.25E-12	9.17E-09	/[	6.00E-06	x	1004	]=	1.52E-06
Copper	1.10E-09	x		=	NA	1.10E-08	/[		x	1005	]=	NA
Fluoride	1.49E-10	x		=	NA	1.49E-09	/[	1.30E-02	x	1000	]=	1.15E-10
Iron	2.35E-06	x		=	NA	2.35E-05	/[		x	1000	]=	NA
Lithium	6.81E-10	x		=	NA	6.81E-09	/[		x	1000	]=	NA
Manganese	3.68E-08	x		=	NA	3.68E-07	/[	5.00E-05	x	1000	]=	7.35E-06
Molybdenum	1.80E-10	x	0.00E+00	=	0.00E+00	1.80E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	1.18E-09	x	2.60E-04	=	3.06E-13	1.18E-08	/[	9.00E-05	x	1000	]=	1.31E-07
Nitrate	2.92E-09	x		=	NA	2.92E-08	/[		x	1000	]=	NA
Nitrite	1.17E-10	x		=	NA	1.17E-09	/[		x	1000	]=	NA
Selenium	8.85E-11	x	0.00E+00	=	0.00E+00	8.85E-10	/[	2.00E-02	x	1000	]=	4.43E-11
Silver	5.90E-12	x		=	NA	5.90E-11	/[		x	1000	]=	NA
Strontium	3.01E-09	x		=	NA	3.01E-08	/[		x	1000	]=	NA
Total Uranium	4.91E-11	x		=	NA	4.91E-10	/[	4.00E-05	x	1000	]=	1.23E-08
Vanadium	5.96E-09	x		=	NA	5.96E-08	/[	1.00E-04	x	1000	]=	5.96E-07
Zinc	4.03E-09	x		=	NA	4.03E-08	/[		x	1000	]=	NA
Butylbenzylphthalate	1.80E-11	x	0.00E+00	=	0.00E+00	1.80E-10	/[		x	1000	]=	NA
Di-n-butylphthalate	5.13E-11	x	0.00E+00	=	0.00E+00	5.13E-10	/[	0.00E+00	x	1000	]=	NA
Styrene	3.55E-14	x	0.00E+00	=	0.00E+00	3.55E-13	/[	1.00E+00	x	1000	]=	3.55E-16
Toluene	5.57E-14	x	0.00E+00	=	0.00E+00	5.57E-13	/	5.00E+00	x	1000	]=	1.11E-16
			Pathway total =		1.38E-10					Pathway total =		1.15E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.33E-08	x	1.50E+00	=	4.99E-08	3.33E-07	/	3.00E-04	=	1.11E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.04E-11	x		=	NA	3.04E-10	/	2.50E-05	=	1.21E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	4.42E-09	x	1.90E-03	=	8.40E-12	4.42E-08	/	2.00E-01	=	2.21E-07
Di-n-butylphthalate	1.26E-08	x		=	NA	1.26E-07	/	1.00E-01	=	1.26E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		4.99E-08			Pathway total =		1.12E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Arsenic	Sum of all pathways	=	3.47E-07	Sum of all pathways	=	7.7E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Beryllium	Sum of all pathways	=	4.30E-14	Sum of all pathways	=	3.9E-05
Cadmium	Sum of all pathways	=	2.23E-14	Sum of all pathways	=	6.6E-05
Chromium	Sum of all pathways	=	1.27E-10	Sum of all pathways	=	2.2E-03
Cobalt	Sum of all pathways	=	8.25E-12	Sum of all pathways	=	1.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-03
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Nickel	Sum of all pathways	=	3.06E-13	Sum of all pathways	=	2.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-05
Butylbenzylphthalate	Sum of all pathways	=	2.34E-11	Sum of all pathways	=	6.2E-07
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-06
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-09

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.47E-07	All Pathways and Chemicals	=	5.00E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.05E-04	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	8.52E-08	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	3.11E-07	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	9.63E-06	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	1.29E-08	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Boron	1.73E-06	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	4.46E-09	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	4.58E-07	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.26E-07	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.44E-07	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	6.04E-08	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.51E-04	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.42E-07	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.51E-05	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	6.39E-10	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	5.40E-07	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	3.64E-07	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	9.86E-08	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	2.46E-09	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	4.93E-06	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Tin	1.42E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.57E-08	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.14E-06	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	2.06E-06	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	8.17E-08	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	3.07E-09	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.05E-03	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	8.52E-07	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	3.11E-06	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	9.63E-05	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	1.29E-07	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Boron	1.73E-05	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	4.46E-08	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	4.58E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.26E-06	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.44E-06	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	6.04E-07	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.51E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.42E-06	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.51E-04	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	6.39E-09	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	5.40E-06	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	3.64E-06	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	9.86E-07	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	2.46E-08	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	4.93E-05	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Tin	1.42E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.57E-07	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.14E-05	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	2.06E-05	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	8.17E-07	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	3.07E-08	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	6.97E-07	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	1.95E-10	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	7.11E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	2.20E-08	=	[	3.3E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	2.95E-11	=	[	4.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Boron	3.95E-09	=	[	6.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	1.02E-11	=	[	1.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.04E-09	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	7.45E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.24E-09	=	[	1.9E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.38E-10	=	[	2.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.17E-06	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	7.82E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.45E-08	=	[	5.2E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	1.46E-12	=	[	2.2E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.23E-09	=	[	1.9E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	8.31E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	2.25E-10	=	[	3.4E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	5.62E-12	=	[	8.5E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	1.13E-08	=	[	1.7E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Tin	3.24E-10	=	[	4.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	5.86E-11	=	[	8.9E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	4.89E-09	=	[	7.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.71E-09	=	[	7.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.86E-10	=	[	2.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.01E-12	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.97E-06	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	1.95E-09	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	7.11E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	2.20E-07	=	[	3.3E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	2.95E-10	=	[	4.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Boron	3.95E-08	=	[	6.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	1.02E-10	=	[	1.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.04E-08	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	7.45E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.24E-08	=	[	1.9E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.38E-09	=	[	2.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.17E-05	=	[	3.3E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	7.82E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.45E-07	=	[	5.2E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	1.46E-11	=	[	2.2E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.23E-08	=	[	1.9E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	8.31E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	2.25E-09	=	[	3.4E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	5.62E-11	=	[	8.5E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	1.13E-07	=	[	1.7E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Tin	3.24E-09	=	[	4.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	5.86E-10	=	[	8.9E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	4.89E-08	=	[	7.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.71E-08	=	[	7.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Bis(2-ethylhexyl) phthalate	1.86E-09	=	[	2.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	2.04E-11	=	[	1.1E-09	x	72	x	8.0	x	7	]	/	[(	8,760	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	5.23E-08	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	2.50E-11	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.57E-08	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	1.72E-09	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	5.23E-07	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	2.50E-10	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	4.57E-07	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	1.72E-08	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.05E-04	x	0.00E+00	=	0.00E+00	3.05E-03	/	1.00E+00	=	3.05E-03
Antimony	8.52E-08	x	0.00E+00	=	0.00E+00	8.52E-07	/	4.00E-04	=	2.13E-03
Arsenic	3.11E-07	x	1.50E+00	=	4.67E-07	3.11E-06	/	3.00E-04	=	1.04E-02
Barium	9.63E-06	x	0.00E+00	=	0.00E+00	9.63E-05	/	2.00E-01	=	4.81E-04
Beryllium	1.29E-08	x	0.00E+00	=	0.00E+00	1.29E-07	/	2.00E-03	=	6.47E-05
Boron	1.73E-06	x	0.00E+00	=	0.00E+00	1.73E-05	/	2.00E-01	=	8.66E-05
Cadmium	4.46E-09	x	0.00E+00	=	0.00E+00	4.46E-08	/	1.00E-03	=	4.46E-05
Chromium	4.58E-07	x	0.00E+00	=	0.00E+00	4.58E-06	/	3.00E-03	=	1.53E-03
Cobalt	3.26E-07	x	0.00E+00	=	0.00E+00	3.26E-06	/	3.00E-04	=	1.09E-02
Copper	5.44E-07	x	0.00E+00	=	0.00E+00	5.44E-06	/	4.00E-02	=	1.36E-04
Fluoride	6.04E-08	x	0.00E+00	=	0.00E+00	6.04E-07	/	4.00E-02	=	1.51E-05
Iron	9.51E-04	x	0.00E+00	=	0.00E+00	9.51E-03	/	7.00E-01	=	1.36E-02
Lithium	3.42E-07	x	0.00E+00	=	0.00E+00	3.42E-06	/	2.00E-03	=	1.71E-03
Manganese	1.51E-05	x	0.00E+00	=	0.00E+00	1.51E-04	/	1.40E-01	=	1.08E-03
Mercury	6.39E-10	x	0.00E+00	=	0.00E+00	6.39E-09	/	0.00E+00	=	NA
Nickel	5.40E-07	x	0.00E+00	=	0.00E+00	5.40E-06	/	2.00E-02	=	2.70E-04
Nitrate	3.64E-07	x	0.00E+00	=	0.00E+00	3.64E-06	/	1.60E+00	=	2.28E-06
Nitrite	9.86E-08	x	0.00E+00	=	0.00E+00	9.86E-07	/	1.00E-01	=	9.86E-06
Silver	2.46E-09	x	0.00E+00	=	0.00E+00	2.46E-08	/	5.00E-03	=	4.92E-06
Strontium	4.93E-06	x	0.00E+00	=	0.00E+00	4.93E-05	/	6.00E-01	=	8.22E-05
Tin	1.42E-07	x	0.00E+00	=	0.00E+00	1.42E-06	/	6.00E-01	=	2.37E-06
Total Uranium	2.57E-08	x	0.00E+00	=	0.00E+00	2.57E-07	/	3.00E-03	=	8.55E-05
Vanadium	2.14E-06	x	0.00E+00	=	0.00E+00	2.14E-05	/	5.00E-03	=	4.28E-03
Zinc	2.06E-06	x	0.00E+00	=	0.00E+00	2.06E-05	/	3.00E-01	=	6.88E-05
Bis(2-ethylhexyl) phthalate	8.17E-08	x	1.40E-02	=	1.14E-09	8.17E-07	/	2.00E-02	=	4.08E-05
Butylbenzylphthalate	3.07E-09	x	1.90E-03	=	5.83E-12	3.07E-08	/	2.00E-01	=	1.53E-07
			Pathway total	=	4.68E-07			Pathway total	=	5.00E-02

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	6.97E-07	x		=	NA	6.97E-06	/[	5.00E-03	x	1000	]=	1.39E-06
Antimony	1.95E-10	x		=	NA	1.95E-09	/[		x	1000	]=	NA
Arsenic	7.11E-10	x	4.30E-03	=	3.06E-12	7.11E-09	/[	1.50E-05	x	1000	]=	4.74E-07
Barium	2.20E-08	x		=	NA	2.20E-07	/[	5.00E-04	x	1000	]=	4.40E-07
Beryllium	2.95E-11	x	2.40E-03	=	7.09E-14	2.95E-10	/[	2.00E-05	x	1000	]=	1.48E-08
Boron	3.95E-09	x	0.00E+00	=	0.00E+00	3.95E-08	/[	2.00E-02	x	1000	]=	1.98E-09
Cadmium	1.02E-11	x	1.80E-03	=	1.83E-14	1.02E-10	/[	1.00E-05	x	1000	]=	1.02E-08
Chromium	1.04E-09	x	8.40E-02	=	8.78E-11	1.04E-08	/[	1.00E-04	x	1000	]=	1.04E-07
Cobalt	7.45E-10	x	9.00E-03	=	6.70E-12	7.45E-09	/[	6.00E-06	x	1000	]=	1.24E-06
Copper	1.24E-09	x		=	NA	1.24E-08	/[		x	1000	]=	NA
Fluoride	1.38E-10	x		=	NA	1.38E-09	/[	1.30E-02	x	1000	]=	1.06E-10
Iron	2.17E-06	x		=	NA	2.17E-05	/[		x	1000	]=	NA
Lithium	7.82E-10	x		=	NA	7.82E-09	/[		x	1000	]=	NA
Manganese	3.45E-08	x		=	NA	3.45E-07	/[	5.00E-05	x	1000	]=	6.90E-06
Mercury	1.46E-12	x	0.00E+00	=	0.00E+00	1.46E-11	/[	3.00E-04	x	1000	]=	4.86E-11
Nickel	1.23E-09	x	2.60E-04	=	3.21E-13	1.23E-08	/[	9.00E-05	x	1000	]=	1.37E-07
Nitrate	8.31E-10	x		=	NA	8.31E-09	/[		x	1000	]=	NA
Nitrite	2.25E-10	x		=	NA	2.25E-09	/[		x	1000	]=	NA
Silver	5.62E-12	x		=	NA	5.62E-11	/[		x	1000	]=	NA
Strontium	1.13E-08	x		=	NA	1.13E-07	/[		x	1000	]=	NA
Tin	3.24E-10	x		=	NA	3.24E-09	/[		x	1000	]=	NA
Total Uranium	5.86E-11	x		=	NA	5.86E-10	/[	4.00E-05	x	1000	]=	1.46E-08
Vanadium	4.89E-09	x		=	NA	4.89E-08	/[	1.00E-04	x	1000	]=	4.89E-07
Zinc	4.71E-09	x		=	NA	4.71E-08	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.86E-10	x	2.40E-06	=	4.47E-16	1.86E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	7.01E-12	x	0.00E+00	=	0.00E+00	2.04E-11	/		x	1000	]=	NA
			Pathway total =		9.79E-11					Pathway total =		1.12E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.23E-08	x	1.50E+00	=	7.84E-08	5.23E-07	/	3.00E-04	=	1.74E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	2.50E-11	x		=	NA	2.50E-10	/	2.50E-05	=	9.99E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	4.57E-08	x	1.40E-02	=	6.40E-10	4.57E-07	/	2.00E-02	=	2.29E-05
Butylbenzylphthalate	1.72E-09	x	1.90E-03	=	3.27E-12	1.72E-08	/	2.00E-01	=	8.59E-08
			Pathway total =		7.91E-08			Pathway total =		1.78E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-03
Arsenic	Sum of all pathways	=	5.45E-07	Sum of all pathways	=	1.2E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-04
Beryllium	Sum of all pathways	=	7.09E-14	Sum of all pathways	=	6.5E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-05
Cadmium	Sum of all pathways	=	1.83E-14	Sum of all pathways	=	5.5E-05
Chromium	Sum of all pathways	=	8.78E-11	Sum of all pathways	=	1.5E-03
Cobalt	Sum of all pathways	=	6.70E-12	Sum of all pathways	=	1.1E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-11
Nickel	Sum of all pathways	=	3.21E-13	Sum of all pathways	=	2.7E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	9.9E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-05
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.78E-09	Sum of all pathways	=	6.4E-05
Butylbenzylphthalate	Sum of all pathways	=	9.10E-12	Sum of all pathways	=	2.4E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	5.47E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.18E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.52E-04	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	1.06E-08	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	1.42E-07	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.29E-06	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	6.47E-09	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	3.77E-09	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	3.82E-07	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.26E-07	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	4.80E-07	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	4.99E-08	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	8.31E-04	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	2.79E-07	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.40E-05	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	6.75E-10	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	9.67E-08	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	5.18E-07	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	3.03E-07	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	1.22E-07	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	5.33E-08	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	3.71E-09	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.22E-06	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.71E-08	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.33E-06	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.50E-06	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	1.82E-09	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
1-Butanol	8.76E-10	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	7.26E-08	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	2.34E-09	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Hexane	2.39E-09	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	8.94E-10	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.52E-03	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	1.06E-07	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	1.42E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.29E-05	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	6.47E-08	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	3.77E-08	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	3.82E-06	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.26E-06	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	4.80E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	4.99E-07	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	8.31E-03	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	2.79E-06	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.40E-04	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	6.75E-09	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	9.67E-07	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	5.18E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	3.03E-06	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	1.22E-06	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	5.33E-07	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	3.71E-08	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.22E-05	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.71E-07	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.33E-05	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.50E-05	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	1.82E-08	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
1-Butanol	8.76E-09	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	7.26E-07	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	2.34E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Hexane	2.39E-08	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	8.94E-09	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	5.76E-07	=	[	8.8E-05	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.43E-11	=	[	3.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	3.24E-10	=	[	4.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	7.52E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	1.48E-11	=	[	2.2E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	8.62E-12	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	8.72E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	7.44E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.10E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.14E-10	=	[	1.7E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	1.90E-06	=	[	2.9E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	6.37E-10	=	[	9.7E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.21E-08	=	[	4.9E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	1.54E-12	=	[	2.3E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Molybdenum	2.21E-10	=	[	3.4E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.18E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	6.92E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	2.79E-10	=	[	4.2E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Selenium	1.22E-10	=	[	1.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	8.46E-12	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	2.79E-09	=	[	4.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	6.19E-11	=	[	9.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	5.32E-09	=	[	8.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	3.42E-09	=	[	5.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Acetone	4.16E-12	=	[	6.3E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
1-Butanol	2.00E-12	=	[	3.0E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.66E-10	=	[	2.5E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	5.33E-12	=	[	8.1E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Hexane	5.45E-12	=	[	8.3E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
beta-BHC	2.04E-12	=	[	3.1E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	5.76E-06	=	[	8.8E-05	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.43E-10	=	[	3.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	3.24E-09	=	[	4.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	7.52E-08	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	1.48E-10	=	[	2.2E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	8.62E-11	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	8.72E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	7.44E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.10E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.14E-09	=	[	1.7E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	1.90E-05	=	[	2.9E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	6.37E-09	=	[	9.7E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.21E-07	=	[	4.9E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	1.54E-11	=	[	2.3E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Molybdenum	2.21E-09	=	[	3.4E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.18E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	6.92E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	2.79E-09	=	[	4.2E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Selenium	1.22E-09	=	[	1.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	8.46E-11	=	[	1.3E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	2.79E-08	=	[	4.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	6.19E-10	=	[	9.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	5.32E-08	=	[	8.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	3.42E-08	=	[	5.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Acetone	4.16E-11	=	[	6.3E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
1-Butanol	2.00E-11	=	[	3.0E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Bis(2-ethylhexyl) phthalate	1.66E-09	=	[	2.5E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	5.33E-11	=	[	8.1E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Hexane	5.45E-11	=	[	8.3E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
beta-BHC	2.04E-11	=	[	3.1E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.39E-08	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	2.11E-11	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
1-Butanol	4.90E-10	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.07E-08	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	1.31E-09	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	5.00E-10	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.39E-07	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	2.11E-10	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
1-Butanol	4.90E-09	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	4.07E-07	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	1.31E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	5.00E-09	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.52E-04	x	0.00E+00	=	0.00E+00	2.52E-03	/	1.00E+00	=	2.52E-03
Antimony	1.06E-08	x	0.00E+00	=	0.00E+00	1.06E-07	/	4.00E-04	=	2.66E-04
Arsenic	1.42E-07	x	1.50E+00	=	2.13E-07	1.42E-06	/	3.00E-04	=	4.73E-03
Barium	3.29E-06	x	0.00E+00	=	0.00E+00	3.29E-05	/	2.00E-01	=	1.65E-04
Beryllium	6.47E-09	x	0.00E+00	=	0.00E+00	6.47E-08	/	2.00E-03	=	3.23E-05
Cadmium	3.77E-09	x	0.00E+00	=	0.00E+00	3.77E-08	/	1.00E-03	=	3.77E-05
Chromium	3.82E-07	x	0.00E+00	=	0.00E+00	3.82E-06	/	3.00E-03	=	1.27E-03
Cobalt	3.26E-07	x	0.00E+00	=	0.00E+00	3.26E-06	/	3.00E-04	=	1.09E-02
Copper	4.80E-07	x	0.00E+00	=	0.00E+00	4.80E-06	/	4.00E-02	=	1.20E-04
Fluoride	4.99E-08	x	0.00E+00	=	0.00E+00	4.99E-07	/	4.00E-02	=	1.25E-05
Iron	8.31E-04	x	0.00E+00	=	0.00E+00	8.31E-03	/	7.00E-01	=	1.19E-02
Lithium	2.79E-07	x	0.00E+00	=	0.00E+00	2.79E-06	/	2.00E-03	=	1.39E-03
Manganese	1.40E-05	x	0.00E+00	=	0.00E+00	1.40E-04	/	1.40E-01	=	1.00E-03
Mercury	6.75E-10	x	0.00E+00	=	0.00E+00	6.75E-09	/	0.00E+00	=	NA
Molybdenum	9.67E-08	x	0.00E+00	=	0.00E+00	9.67E-07	/	5.00E-03	=	1.93E-04
Nickel	5.18E-07	x	0.00E+00	=	0.00E+00	5.18E-06	/	2.00E-02	=	2.59E-04
Nitrate	3.03E-07	x	0.00E+00	=	0.00E+00	3.03E-06	/	1.60E+00	=	1.89E-06
Nitrite	1.22E-07	x	0.00E+00	=	0.00E+00	1.22E-06	/	1.00E-01	=	1.22E-05
Selenium	5.33E-08	x	0.00E+00	=	0.00E+00	5.33E-07	/	5.00E-03	=	1.07E-04
Silver	3.71E-09	x	0.00E+00	=	0.00E+00	3.71E-08	/	5.00E-03	=	7.42E-06
Strontium	1.22E-06	x	0.00E+00	=	0.00E+00	1.22E-05	/	6.00E-01	=	2.04E-05
Total Uranium	2.71E-08	x	0.00E+00	=	0.00E+00	2.71E-07	/	3.00E-03	=	9.04E-05
Vanadium	2.33E-06	x	0.00E+00	=	0.00E+00	2.33E-05	/	5.00E-03	=	4.66E-03
Zinc	1.50E-06	x	0.00E+00	=	0.00E+00	1.50E-05	/	3.00E-01	=	5.00E-05
Acetone	1.82E-09	x	0.00E+00	=	0.00E+00	1.82E-08	/	9.00E-01	=	2.03E-08
1-Butanol	8.76E-10	x	0.00E+00	=	0.00E+00	8.76E-09	/	1.00E-01	=	8.76E-08
Bis(2-ethylhexyl) phthalate	7.26E-08	x	1.40E-02	=	1.02E-09	7.26E-07	/	2.00E-02	=	3.63E-05
Butylbenzylphthalate	2.34E-09	x	1.90E-03	=	4.44E-12	2.34E-08	/	2.00E-01	=	1.17E-07
Hexane	2.39E-09	x	0.00E+00	=	0.00E+00	2.39E-08	/	6.00E-02	=	3.98E-07
beta-BHC	8.94E-10	x	1.80E+00	=	1.61E-09	8.94E-09	/	0.00E+00	=	NA
			Pathway total	=	2.16E-07			Pathway total	=	3.97E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	5.76E-07	x		=	NA	5.76E-06	/[	5.00E-03	x	1000	]=	1.15E-06
Antimony	2.43E-11	x		=	NA	2.43E-10	/[		x	1000	]=	NA
Arsenic	3.24E-10	x	4.30E-03	=	1.39E-12	3.24E-09	/[	1.50E-05	x	1000	]=	2.16E-07
Barium	7.52E-09	x		=	NA	7.52E-08	/[	5.00E-04	x	1000	]=	1.50E-07
Beryllium	1.48E-11	x	2.40E-03	=	3.54E-14	1.48E-10	/[	2.00E-05	x	1000	]=	7.38E-09
Cadmium	8.62E-12	x	1.80E-03	=	1.55E-14	8.62E-11	/[	1.00E-05	x	1000	]=	8.62E-09
Chromium	8.72E-10	x	8.40E-02	=	7.32E-11	8.72E-09	/[	1.00E-04	x	1000	]=	8.72E-08
Cobalt	7.44E-10	x	9.00E-03	=	6.70E-12	7.44E-09	/[	6.00E-06	x	1000	]=	1.24E-06
Copper	1.10E-09	x		=	NA	1.10E-08	/[		x	1000	]=	NA
Fluoride	1.14E-10	x		=	NA	1.14E-09	/[	1.30E-02	x	1000	]=	8.76E-11
Iron	1.90E-06	x		=	NA	1.90E-05	/[		x	1000	]=	NA
Lithium	6.37E-10	x		=	NA	6.37E-09	/[		x	1000	]=	NA
Manganese	3.21E-08	x		=	NA	3.21E-07	/[	5.00E-05	x	1000	]=	6.41E-06
Mercury	1.54E-12	x	0.00E+00	=	0.00E+00	1.54E-11	/[	3.00E-04	x	1000	]=	5.13E-11
Molybdenum	2.21E-10	x	0.00E+00	=	0.00E+00	2.21E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	1.18E-09	x	2.60E-04	=	3.08E-13	1.18E-08	/[	9.00E-05	x	1000	]=	1.31E-07
Nitrate	6.92E-10	x		=	NA	6.92E-09	/[		x	1000	]=	NA
Nitrite	2.79E-10	x		=	NA	2.79E-09	/[		x	1000	]=	NA
Selenium	1.22E-10	x	0.00E+00	=	0.00E+00	1.22E-09	/[	2.00E-02	x	1000	]=	6.08E-11
Silver	8.46E-12	x		=	NA	8.46E-11	/[		x	1000	]=	NA
Strontium	2.79E-09	x		=	NA	2.79E-08	/[		x	1000	]=	NA
Total Uranium	6.19E-11	x		=	NA	6.19E-10	/[	4.00E-05	x	1000	]=	1.55E-08
Vanadium	5.32E-09	x		=	NA	5.32E-08	/[	1.00E-04	x	1000	]=	5.32E-07
Zinc	3.42E-09	x		=	NA	3.42E-08	/[		x	1000	]=	NA
Acetone	4.16E-12	x	0.00E+00	=	0.00E+00	4.16E-11	/[	3.10E+01	x	1000	]=	1.34E-15
1-Butanol	2.00E-12	x	0.00E+00	=	0.00E+00	2.00E-11	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	1.66E-10	x	2.40E-06	=	3.98E-16	1.66E-09	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	5.33E-12	x	0.00E+00	=	0.00E+00	5.33E-11	/[		x	1000	]=	NA
Hexane	5.45E-12	x	0.00E+00	=	0.00E+00	5.45E-11	/[	7.00E-01	x	1000	]=	7.78E-14
beta-BHC	2.04E-12	x	5.30E-04	=	1.08E-15	2.04E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		8.17E-11					Pathway total =		9.95E-06

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.39E-08	x	1.50E+00	=	3.58E-08	2.39E-07	/	3.00E-04	=	7.95E-04
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.11E-11	x		=	NA	2.11E-10	/	2.50E-05	=	8.45E-06
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	4.90E-10	x		=	NA	4.90E-09	/	1.00E-01	=	4.90E-08
Bis(2-ethylhexyl) phthalate	4.07E-08	x	1.40E-02	=	5.69E-10	4.07E-07	/	2.00E-02	=	2.03E-05
Butylbenzylphthalate	1.31E-09	x	1.90E-03	=	2.49E-12	1.31E-08	/	2.00E-01	=	6.54E-08
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	5.00E-10	x	1.80E+00	=	9.01E-10	5.00E-09	/		=	NA
			Pathway total =		3.73E-08			Pathway total =		8.24E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04
Arsenic	Sum of all pathways	=	2.49E-07	Sum of all pathways	=	5.5E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Beryllium	Sum of all pathways	=	3.54E-14	Sum of all pathways	=	3.2E-05
Cadmium	Sum of all pathways	=	1.55E-14	Sum of all pathways	=	4.6E-05
Chromium	Sum of all pathways	=	7.32E-11	Sum of all pathways	=	1.3E-03
Cobalt	Sum of all pathways	=	6.70E-12	Sum of all pathways	=	1.1E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-11
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Nickel	Sum of all pathways	=	3.08E-13	Sum of all pathways	=	2.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-08
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.59E-09	Sum of all pathways	=	5.7E-05
Butylbenzylphthalate	Sum of all pathways	=	6.92E-12	Sum of all pathways	=	1.8E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-07
beta-BHC	Sum of all pathways	=	2.51E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.53E-07	All Pathways and Chemicals	=	4.06E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.81E-04	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	9.28E-09	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.00E-07	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.22E-06	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	1.09E-08	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	4.76E-09	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	4.89E-07	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.61E-07	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.04E-07	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	1.13E-07	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.98E-04	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.30E-07	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.44E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	7.57E-10	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	4.38E-07	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	4.51E-07	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	1.82E-07	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	7.00E-09	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.31E-06	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Tin	5.68E-07	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	6.19E-08	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	3.07E-06	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	7.24E-06	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	3.87E-10	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	9.07E-08	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Di-n-butylphthalate	3.40E-08	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	5.29E-11	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	1.16E-11	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	1.02E-09	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1260	1.06E-09	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.81E-03	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	9.28E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.00E-06	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.22E-05	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	1.09E-07	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	4.76E-08	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	4.89E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.61E-06	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.04E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	1.13E-06	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.98E-03	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.30E-06	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.44E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	7.57E-09	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	4.38E-06	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	4.51E-06	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	1.82E-06	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	7.00E-08	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.31E-05	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Tin	5.68E-06	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	6.19E-07	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	3.07E-05	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	7.24E-05	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	3.87E-09	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	9.07E-07	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Di-n-butylphthalate	3.40E-07	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	5.29E-10	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	1.16E-10	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	1.02E-08	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1260	1.06E-08	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	6.42E-07	=	[	9.8E-05	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.12E-11	=	[	3.2E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	4.56E-10	=	[	6.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	7.34E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	2.49E-11	=	[	3.8E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	1.09E-11	=	[	1.7E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.12E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	8.25E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.15E-09	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	2.59E-10	=	[	3.9E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.28E-06	=	[	3.5E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	7.54E-10	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.28E-08	=	[	5.0E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	1.73E-12	=	[	2.6E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	1.00E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	1.03E-09	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	4.15E-10	=	[	6.3E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	1.60E-11	=	[	2.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	2.99E-09	=	[	4.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Tin	1.30E-09	=	[	2.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	1.41E-10	=	[	2.1E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	7.00E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	1.65E-08	=	[	2.5E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Acetone	8.83E-13	=	[	1.3E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.07E-10	=	[	3.2E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	7.77E-11	=	[	1.2E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Methylene chloride	1.21E-13	=	[	1.8E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	2.65E-14	=	[	4.0E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
beta-BHC	2.32E-12	=	[	3.5E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.41E-12	=	[	3.7E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	6.42E-06	=	[	9.8E-05	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.12E-10	=	[	3.2E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	4.56E-09	=	[	6.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	7.34E-08	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	2.49E-10	=	[	3.8E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	1.09E-10	=	[	1.7E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.12E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	8.25E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.15E-08	=	[	1.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	2.59E-09	=	[	3.9E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.28E-05	=	[	3.5E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	7.54E-09	=	[	1.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.28E-07	=	[	5.0E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	1.73E-11	=	[	2.6E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	1.00E-08	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	1.03E-08	=	[	1.6E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	4.15E-09	=	[	6.3E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	1.60E-10	=	[	2.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	2.99E-08	=	[	4.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Tin	1.30E-08	=	[	2.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	1.41E-09	=	[	2.1E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	7.00E-08	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	1.65E-07	=	[	2.5E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Acetone	8.83E-12	=	[	1.3E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Bis(2-ethylhexyl) phthalate	2.07E-09	=	[	3.2E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Di-n-butylphthalate	7.77E-10	=	[	1.2E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Methylene chloride	1.21E-12	=	[	1.8E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	2.65E-13	=	[	4.0E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
beta-BHC	2.32E-11	=	[	3.5E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Aroclor-1260	2.41E-11	=	[	3.7E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	3.36E-08	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	2.67E-11	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.08E-08	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Di-n-butylphthalate	1.91E-08	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
beta-BHC	5.70E-10	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Aroclor-1260	8.29E-10	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	3.36E-07	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	2.67E-10	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Bis(2-ethylhexyl) phthalate	5.08E-07	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Di-n-butylphthalate	1.91E-07	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
beta-BHC	5.70E-09	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Aroclor-1260	8.29E-09	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.81E-04	x	0.00E+00	=	0.00E+00	2.81E-03	/	1.00E+00	=	2.81E-03
Antimony	9.28E-09	x	0.00E+00	=	0.00E+00	9.28E-08	/	4.00E-04	=	2.32E-04
Arsenic	2.00E-07	x	1.50E+00	=	3.00E-07	2.00E-06	/	3.00E-04	=	6.66E-03
Barium	3.22E-06	x	0.00E+00	=	0.00E+00	3.22E-05	/	2.00E-01	=	1.61E-04
Beryllium	1.09E-08	x	0.00E+00	=	0.00E+00	1.09E-07	/	2.00E-03	=	5.45E-05
Cadmium	4.76E-09	x	0.00E+00	=	0.00E+00	4.76E-08	/	1.00E-03	=	4.76E-05
Chromium	4.89E-07	x	0.00E+00	=	0.00E+00	4.89E-06	/	3.00E-03	=	1.63E-03
Cobalt	3.61E-07	x	0.00E+00	=	0.00E+00	3.61E-06	/	3.00E-04	=	1.20E-02
Copper	5.04E-07	x	0.00E+00	=	0.00E+00	5.04E-06	/	4.00E-02	=	1.26E-04
Fluoride	1.13E-07	x	0.00E+00	=	0.00E+00	1.13E-06	/	4.00E-02	=	2.83E-05
Iron	9.98E-04	x	0.00E+00	=	0.00E+00	9.98E-03	/	7.00E-01	=	1.43E-02
Lithium	3.30E-07	x	0.00E+00	=	0.00E+00	3.30E-06	/	2.00E-03	=	1.65E-03
Manganese	1.44E-05	x	0.00E+00	=	0.00E+00	1.44E-04	/	1.40E-01	=	1.03E-03
Mercury	7.57E-10	x	0.00E+00	=	0.00E+00	7.57E-09	/	0.00E+00	=	NA
Nickel	4.38E-07	x	0.00E+00	=	0.00E+00	4.38E-06	/	2.00E-02	=	2.19E-04
Nitrate	4.51E-07	x	0.00E+00	=	0.00E+00	4.51E-06	/	1.60E+00	=	2.82E-06
Nitrite	1.82E-07	x	0.00E+00	=	0.00E+00	1.82E-06	/	1.00E-01	=	1.82E-05
Silver	7.00E-09	x	0.00E+00	=	0.00E+00	7.00E-08	/	5.00E-03	=	1.40E-05
Strontium	1.31E-06	x	0.00E+00	=	0.00E+00	1.31E-05	/	6.00E-01	=	2.18E-05
Tin	5.68E-07	x	0.00E+00	=	0.00E+00	5.68E-06	/	6.00E-01	=	9.47E-06
Total Uranium	6.19E-08	x	0.00E+00	=	0.00E+00	6.19E-07	/	3.00E-03	=	2.06E-04
Vanadium	3.07E-06	x	0.00E+00	=	0.00E+00	3.07E-05	/	5.00E-03	=	6.14E-03
Zinc	7.24E-06	x	0.00E+00	=	0.00E+00	7.24E-05	/	3.00E-01	=	2.41E-04
Acetone	3.87E-10	x	0.00E+00	=	0.00E+00	3.87E-09	/	9.00E-01	=	4.30E-09
Bis(2-ethylhexyl) phthalate	9.07E-08	x	1.40E-02	=	1.27E-09	9.07E-07	/	2.00E-02	=	4.54E-05
Di-n-butylphthalate	3.40E-08	x	0.00E+00	=	0.00E+00	3.40E-07	/	1.00E-01	=	3.40E-06
Methylene chloride	5.29E-11	x	2.00E-03	=	1.06E-13	5.29E-10	/	6.00E-03	=	8.81E-08
Toluene	1.16E-11	x	0.00E+00	=	0.00E+00	1.16E-10	/	8.00E-02	=	1.45E-09
beta-BHC	1.02E-09	x	1.80E+00	=	1.83E-09	1.02E-08	/	0.00E+00	=	NA
Aroclor-1260	1.06E-09	x	2.00E+00	=	2.11E-09	1.06E-08	/	0.00E+00	=	NA
			Pathway total	=	3.05E-07			Pathway total	=	4.77E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	6.42E-07	x		=	NA	6.42E-06	/[	5.00E-03	x	1000	]=	1.28E-06
Antimony	2.12E-11	x		=	NA	2.12E-10	/[		x	1000	]=	NA
Arsenic	4.56E-10	x	4.30E-03	=	1.96E-12	4.56E-09	/[	1.50E-05	x	1000	]=	3.04E-07
Barium	7.34E-09	x		=	NA	7.34E-08	/[	5.00E-04	x	1000	]=	1.47E-07
Beryllium	2.49E-11	x	2.40E-03	=	5.97E-14	2.49E-10	/[	2.00E-05	x	1000	]=	1.24E-08
Cadmium	1.09E-11	x	1.80E-03	=	1.96E-14	1.09E-10	/[	1.00E-05	x	1000	]=	1.09E-08
Chromium	1.12E-09	x	8.40E-02	=	9.38E-11	1.12E-08	/[	1.00E-04	x	1000	]=	1.12E-07
Cobalt	8.25E-10	x	9.00E-03	=	7.42E-12	8.25E-09	/[	6.00E-06	x	1000	]=	1.37E-06
Copper	1.15E-09	x		=	NA	1.15E-08	/[		x	1000	]=	NA
Fluoride	2.59E-10	x		=	NA	2.59E-09	/[	1.30E-02	x	1000	]=	1.99E-10
Iron	2.28E-06	x		=	NA	2.28E-05	/[		x	1000	]=	NA
Lithium	7.54E-10	x		=	NA	7.54E-09	/[		x	1000	]=	NA
Manganese	3.28E-08	x		=	NA	3.28E-07	/[	5.00E-05	x	1000	]=	6.56E-06
Mercury	1.73E-12	x	0.00E+00	=	0.00E+00	1.73E-11	/[	3.00E-04	x	1000	]=	5.76E-11
Nickel	1.00E-09	x	2.60E-04	=	2.60E-13	1.00E-08	/[	9.00E-05	x	1000	]=	1.11E-07
Nitrate	1.03E-09	x		=	NA	1.03E-08	/[		x	1000	]=	NA
Nitrite	4.15E-10	x		=	NA	4.15E-09	/[		x	1000	]=	NA
Silver	1.60E-11	x		=	NA	1.60E-10	/[		x	1000	]=	NA
Strontium	2.99E-09	x		=	NA	2.99E-08	/[		x	1000	]=	NA
Tin	1.30E-09	x		=	NA	1.30E-08	/[		x	1000	]=	NA
Total Uranium	1.41E-10	x		=	NA	1.41E-09	/[	4.00E-05	x	1000	]=	3.53E-08
Vanadium	7.00E-09	x		=	NA	7.00E-08	/[	1.00E-04	x	1000	]=	7.00E-07
Zinc	1.65E-08	x		=	NA	1.65E-07	/[		x	1000	]=	NA
Acetone	8.83E-13	x	0.00E+00	=	0.00E+00	8.83E-12	/[	3.10E+01	x	1000	]=	2.85E-16
Bis(2-ethylhexyl) phthalate	2.07E-10	x	2.40E-06	=	4.97E-16	2.07E-09	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	7.77E-11	x	0.00E+00	=	0.00E+00	7.77E-10	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.21E-13	x	1.00E-08	=	1.21E-21	1.21E-12	/[	6.00E-01	x	1000	]=	2.01E-15
Toluene	2.65E-14	x	0.00E+00	=	0.00E+00	2.65E-13	/[	5.00E+00	x	1000	]=	5.30E-17
beta-BHC	2.32E-12	x	5.30E-04	=	1.23E-15	2.32E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.41E-12	x	5.70E-04	=	1.38E-15	2.41E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.04E-10					Pathway total =		1.07E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.36E-08	x	1.50E+00	=	5.03E-08	3.36E-07	/	3.00E-04	=	1.12E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.67E-11	x		=	NA	2.67E-10	/	2.50E-05	=	1.07E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	5.08E-08	x	1.40E-02	=	7.11E-10	5.08E-07	/	2.00E-02	=	2.54E-05
Di-n-butylphthalate	1.91E-08	x		=	NA	1.91E-07	/	1.00E-01	=	1.91E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	5.70E-10	x	1.80E+00	=	1.03E-09	5.70E-09	/		=	NA
Aroclor-1260	8.29E-10	x	2.00E+00	=	1.66E-09	8.29E-09	/		=	NA
			Pathway total =		5.37E-08			Pathway total =		1.16E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Arsenic	Sum of all pathways	=	3.50E-07	Sum of all pathways	=	7.8E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Beryllium	Sum of all pathways	=	5.97E-14	Sum of all pathways	=	5.4E-05
Cadmium	Sum of all pathways	=	1.96E-14	Sum of all pathways	=	5.8E-05
Chromium	Sum of all pathways	=	9.38E-11	Sum of all pathways	=	1.6E-03
Cobalt	Sum of all pathways	=	7.42E-12	Sum of all pathways	=	1.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-11
Nickel	Sum of all pathways	=	2.60E-13	Sum of all pathways	=	2.2E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.98E-09	Sum of all pathways	=	7.1E-05
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-06
Methylene chloride	Sum of all pathways	=	1.06E-13	Sum of all pathways	=	8.8E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-09
beta-BHC	Sum of all pathways	=	2.86E-09	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	3.77E-09	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.59E-07	All Pathways and Chemicals	=	4.88E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.31E-04	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	9.67E-09	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.30E-07	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.12E-06	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	6.90E-09	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	1.37E-07	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	4.42E-07	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	4.14E-07	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.84E-07	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	1.39E-07	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	1.02E-03	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.57E-07	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.61E-05	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	5.33E-10	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	4.34E-07	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	1.57E-06	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	2.09E-07	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	2.77E-08	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Silver	2.74E-09	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.47E-06	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.60E-08	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.53E-06	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.92E-06	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	2.52E-10	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	4.22E-09	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
2-Hexanone	1.09E-10	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	5.52E-11	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	2.34E-11	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.31E-03	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	9.67E-08	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.30E-06	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.12E-05	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	6.90E-08	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	1.37E-06	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	4.42E-06	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	4.14E-06	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.84E-06	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	1.39E-06	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	1.02E-02	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.57E-06	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.61E-04	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	5.33E-09	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	4.34E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	1.57E-05	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	2.09E-06	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	2.77E-07	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Silver	2.74E-08	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.47E-05	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.60E-07	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.53E-05	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.92E-05	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	2.52E-09	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	4.22E-08	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
2-Hexanone	1.09E-09	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	5.52E-10	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	2.34E-10	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.56E-07	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.21E-11	=	[	3.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	5.25E-10	=	[	8.0E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	7.13E-09	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	1.58E-11	=	[	2.4E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cadmium	3.13E-10	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	1.01E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	9.46E-10	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.33E-09	=	[	2.0E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	3.18E-10	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.33E-06	=	[	3.5E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	8.15E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.68E-08	=	[	5.6E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	1.22E-12	=	[	1.8E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	9.91E-10	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	3.58E-09	=	[	5.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	4.78E-10	=	[	7.3E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Selenium	6.31E-11	=	[	9.6E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Silver	6.25E-12	=	[	9.5E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	3.36E-09	=	[	5.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	5.94E-11	=	[	9.0E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	5.78E-09	=	[	8.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.38E-09	=	[	6.7E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Acetone	5.76E-13	=	[	8.8E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.64E-12	=	[	1.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
2-Hexanone	2.50E-13	=	[	3.8E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Methylene chloride	1.26E-13	=	[	1.9E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	5.33E-14	=	[	8.1E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	7.56E-06	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.21E-10	=	[	3.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	5.25E-09	=	[	8.0E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	7.13E-08	=	[	1.1E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	1.58E-10	=	[	2.4E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cadmium	3.13E-09	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	1.01E-08	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	9.46E-09	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.33E-08	=	[	2.0E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	3.18E-09	=	[	4.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.33E-05	=	[	3.5E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	8.15E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.68E-07	=	[	5.6E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	1.22E-11	=	[	1.8E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	9.91E-09	=	[	1.5E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	3.58E-08	=	[	5.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	4.78E-09	=	[	7.3E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Selenium	6.31E-10	=	[	9.6E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Silver	6.25E-11	=	[	9.5E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	3.36E-08	=	[	5.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	5.94E-10	=	[	9.0E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	5.78E-08	=	[	8.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.38E-08	=	[	6.7E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Acetone	5.76E-12	=	[	8.8E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Butylbenzylphthalate	9.64E-11	=	[	1.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
2-Hexanone	2.50E-12	=	[	3.8E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Methylene chloride	1.26E-12	=	[	1.9E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	5.33E-13	=	[	8.1E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	3.86E-08	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cadmium	7.67E-10	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Butylbenzylphthalate	2.36E-09	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	3.86E-07	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cadmium	7.67E-09	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Butylbenzylphthalate	2.36E-08	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	72	x	7	]	/	[	50	x	2,555	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.31E-04	x	0.00E+00	=	0.00E+00	3.31E-03	/	1.00E+00	=	3.31E-03
Antimony	9.67E-09	x	0.00E+00	=	0.00E+00	9.67E-08	/	4.00E-04	=	2.42E-04
Arsenic	2.30E-07	x	1.50E+00	=	3.45E-07	2.30E-06	/	3.00E-04	=	7.67E-03
Barium	3.12E-06	x	0.00E+00	=	0.00E+00	3.12E-05	/	2.00E-01	=	1.56E-04
Beryllium	6.90E-09	x	0.00E+00	=	0.00E+00	6.90E-08	/	2.00E-03	=	3.45E-05
Cadmium	1.37E-07	x	0.00E+00	=	0.00E+00	1.37E-06	/	1.00E-03	=	1.37E-03
Chromium	4.42E-07	x	0.00E+00	=	0.00E+00	4.42E-06	/	3.00E-03	=	1.47E-03
Cobalt	4.14E-07	x	0.00E+00	=	0.00E+00	4.14E-06	/	3.00E-04	=	1.38E-02
Copper	5.84E-07	x	0.00E+00	=	0.00E+00	5.84E-06	/	4.00E-02	=	1.46E-04
Fluoride	1.39E-07	x	0.00E+00	=	0.00E+00	1.39E-06	/	4.00E-02	=	3.48E-05
Iron	1.02E-03	x	0.00E+00	=	0.00E+00	1.02E-02	/	7.00E-01	=	1.46E-02
Lithium	3.57E-07	x	0.00E+00	=	0.00E+00	3.57E-06	/	2.00E-03	=	1.79E-03
Manganese	1.61E-05	x	0.00E+00	=	0.00E+00	1.61E-04	/	1.40E-01	=	1.15E-03
Mercury	5.33E-10	x	0.00E+00	=	0.00E+00	5.33E-09	/	0.00E+00	=	NA
Nickel	4.34E-07	x	0.00E+00	=	0.00E+00	4.34E-06	/	2.00E-02	=	2.17E-04
Nitrate	1.57E-06	x	0.00E+00	=	0.00E+00	1.57E-05	/	1.60E+00	=	9.79E-06
Nitrite	2.09E-07	x	0.00E+00	=	0.00E+00	2.09E-06	/	1.00E-01	=	2.09E-05
Selenium	2.77E-08	x	0.00E+00	=	0.00E+00	2.77E-07	/	5.00E-03	=	5.53E-05
Silver	2.74E-09	x	0.00E+00	=	0.00E+00	2.74E-08	/	5.00E-03	=	5.48E-06
Strontium	1.47E-06	x	0.00E+00	=	0.00E+00	1.47E-05	/	6.00E-01	=	2.45E-05
Total Uranium	2.60E-08	x	0.00E+00	=	0.00E+00	2.60E-07	/	3.00E-03	=	8.68E-05
Vanadium	2.53E-06	x	0.00E+00	=	0.00E+00	2.53E-05	/	5.00E-03	=	5.07E-03
Zinc	1.92E-06	x	0.00E+00	=	0.00E+00	1.92E-05	/	3.00E-01	=	6.39E-05
Acetone	2.52E-10	x	0.00E+00	=	0.00E+00	2.52E-09	/	9.00E-01	=	2.81E-09
Butylbenzylphthalate	4.22E-09	x	1.90E-03	=	8.02E-12	4.22E-08	/	2.00E-01	=	2.11E-07
2-Hexanone	1.09E-10	x	0.00E+00	=	0.00E+00	1.09E-09	/	5.00E-03	=	2.19E-07
Methylene chloride	5.52E-11	x	2.00E-03	=	1.10E-13	5.52E-10	/	6.00E-03	=	9.21E-08
Toluene	2.34E-11	x	0.00E+00	=	0.00E+00	2.34E-10	/	8.00E-02	=	2.92E-09
			Pathway total	=	3.45E-07			Pathway total	=	5.13E-02

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.56E-07	x		=	NA	7.56E-06	/[	5.00E-03	x	1000	]=	1.51E-06
Antimony	2.21E-11	x		=	NA	2.21E-10	/[		x	1000	]=	NA
Arsenic	5.25E-10	x	4.30E-03	=	2.26E-12	5.25E-09	/[	1.50E-05	x	1000	]=	3.50E-07
Barium	7.13E-09	x		=	NA	7.13E-08	/[	5.00E-04	x	1000	]=	1.43E-07
Beryllium	1.58E-11	x	2.40E-03	=	3.78E-14	1.58E-10	/[	2.00E-05	x	1000	]=	7.88E-09
Cadmium	3.13E-10	x	1.80E-03	=	5.63E-13	3.13E-09	/[	1.00E-05	x	1000	]=	3.13E-07
Chromium	1.01E-09	x	8.40E-02	=	8.47E-11	1.01E-08	/[	1.00E-04	x	1000	]=	1.01E-07
Cobalt	9.46E-10	x	9.00E-03	=	8.51E-12	9.46E-09	/[	6.00E-06	x	1000	]=	1.58E-06
Copper	1.33E-09	x		=	NA	1.33E-08	/[		x	1000	]=	NA
Fluoride	3.18E-10	x		=	NA	3.18E-09	/[	1.30E-02	x	1000	]=	2.45E-10
Iron	2.33E-06	x		=	NA	2.33E-05	/[		x	1000	]=	NA
Lithium	8.15E-10	x		=	NA	8.15E-09	/[		x	1000	]=	NA
Manganese	3.68E-08	x		=	NA	3.68E-07	/[	5.00E-05	x	1000	]=	7.37E-06
Mercury	1.22E-12	x	0.00E+00	=	0.00E+00	1.22E-11	/[	3.00E-04	x	1000	]=	4.05E-11
Nickel	9.91E-10	x	2.60E-04	=	2.58E-13	9.91E-09	/[	9.00E-05	x	1000	]=	1.10E-07
Nitrate	3.58E-09	x		=	NA	3.58E-08	/[		x	1000	]=	NA
Nitrite	4.78E-10	x		=	NA	4.78E-09	/[		x	1000	]=	NA
Selenium	6.31E-11	x	0.00E+00	=	0.00E+00	6.31E-10	/[	2.00E-02	x	1000	]=	3.16E-11
Silver	6.25E-12	x		=	NA	6.25E-11	/[		x	1000	]=	NA
Strontium	3.36E-09	x		=	NA	3.36E-08	/[		x	1000	]=	NA
Total Uranium	5.94E-11	x		=	NA	5.94E-10	/[	4.00E-05	x	1000	]=	1.49E-08
Vanadium	5.78E-09	x		=	NA	5.78E-08	/[	1.00E-04	x	1000	]=	5.78E-07
Zinc	4.38E-09	x		=	NA	4.38E-08	/[		x	1000	]=	NA
Acetone	5.76E-13	x	0.00E+00	=	0.00E+00	5.76E-12	/[	3.10E+01	x	1000	]=	1.86E-16
Butylbenzylphthalate	9.64E-12	x	0.00E+00	=	0.00E+00	9.64E-11	/[		x	1000	]=	NA
2-Hexanone	2.50E-13	x	0.00E+00	=	0.00E+00	2.50E-12	/[	3.00E-02	x	1000	]=	8.32E-14
Methylene chloride	1.26E-13	x	1.00E-08	=	1.26E-21	1.26E-12	/[	6.00E-01	x	1000	]=	2.10E-15
Toluene	5.33E-14	x	0.00E+00	=	0.00E+00	5.33E-13	/	5.00E+00	x	1000	]=	1.07E-16
			Pathway total =		9.64E-11					Pathway total =		1.21E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.86E-08	x	1.50E+00	=	5.80E-08	3.86E-07	/	3.00E-04	=	1.29E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.67E-10	x		=	NA	7.67E-09	/	2.50E-05	=	3.07E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	2.36E-09	x	1.90E-03	=	4.49E-12	2.36E-08	/	2.00E-01	=	1.18E-07
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		5.80E-08			Pathway total =		1.59E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Arsenic	Sum of all pathways	=	4.03E-07	Sum of all pathways	=	9.0E-03
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Beryllium	Sum of all pathways	=	3.78E-14	Sum of all pathways	=	3.5E-05
Cadmium	Sum of all pathways	=	5.63E-13	Sum of all pathways	=	1.7E-03
Chromium	Sum of all pathways	=	8.47E-11	Sum of all pathways	=	1.5E-03
Cobalt	Sum of all pathways	=	8.51E-12	Sum of all pathways	=	1.4E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-11
Nickel	Sum of all pathways	=	2.58E-13	Sum of all pathways	=	2.2E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	9.8E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-06
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-09
Butylbenzylphthalate	Sum of all pathways	=	1.25E-11	Sum of all pathways	=	3.3E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-07
Methylene chloride	Sum of all pathways	=	1.10E-13	Sum of all pathways	=	9.2E-08
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	4.03E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.29E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Youth Trespasser
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.26E-04	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	1.15E-08	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	2.76E-07	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Barium	3.82E-06	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	9.27E-09	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Boron	2.53E-07	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	3.95E-07	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	3.44E-07	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Copper	5.21E-07	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	7.97E-08	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Iron	9.11E-04	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	3.65E-07	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	1.44E-05	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	8.13E-10	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	9.98E-08	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	3.87E-07	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	3.36E-07	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	8.64E-08	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	7.89E-08	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	1.96E-06	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	2.44E-08	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	2.05E-06	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	1.79E-06	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	2.44E-10	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Benzene	1.29E-11	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	1.49E-11	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	2.91E-11	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	3.26E-03	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	1.15E-07	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	2.76E-06	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Barium	3.82E-05	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	9.27E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Boron	2.53E-06	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	3.95E-06	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	3.44E-06	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Copper	5.21E-06	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	7.97E-07	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Iron	9.11E-03	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	3.65E-06	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	1.44E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	8.13E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	9.98E-07	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	3.87E-06	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	3.36E-06	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	8.64E-07	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	7.89E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	1.96E-05	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	2.44E-07	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	2.05E-05	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	1.79E-05	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	2.44E-09	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Benzene	1.29E-10	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	1.49E-10	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	2.91E-10	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	72	x	7	]	/	[	50	x	2,555	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.45E-07	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Antimony	2.62E-11	=	[	4.0E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Arsenic	6.31E-10	=	[	9.6E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Barium	8.73E-09	=	[	1.3E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Beryllium	2.12E-11	=	[	3.2E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Boron	5.78E-10	=	[	8.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Chromium	9.01E-10	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Cobalt	7.86E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Copper	1.19E-09	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Fluoride	1.82E-10	=	[	2.8E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Iron	2.08E-06	=	[	3.2E-04	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Lithium	8.32E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Manganese	3.28E-08	=	[	5.0E-06	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Mercury	1.86E-12	=	[	2.8E-10	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Molybdenum	2.28E-10	=	[	3.5E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nickel	8.83E-10	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrate	7.67E-10	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Nitrite	1.97E-10	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Selenium	1.80E-10	=	[	2.7E-08	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Strontium	4.47E-09	=	[	6.8E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Total Uranium	5.56E-11	=	[	8.5E-09	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Vanadium	4.67E-09	=	[	7.1E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Zinc	4.08E-09	=	[	6.2E-07	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Acetone	5.57E-13	=	[	8.5E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Benzene	2.95E-14	=	[	4.5E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Styrene	3.40E-14	=	[	5.2E-12	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]
Toluene	6.65E-14	=	[	1.0E-11	x	72	x	8.0	x	7	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	7.45E-06	=	[	1.1E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Antimony	2.62E-10	=	[	4.0E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Arsenic	6.31E-09	=	[	9.6E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Barium	8.73E-08	=	[	1.3E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Beryllium	2.12E-10	=	[	3.2E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Boron	5.78E-09	=	[	8.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Chromium	9.01E-09	=	[	1.4E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Cobalt	7.86E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Copper	1.19E-08	=	[	1.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Fluoride	1.82E-09	=	[	2.8E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Iron	2.08E-05	=	[	3.2E-04	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Lithium	8.32E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Manganese	3.28E-07	=	[	5.0E-06	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Mercury	1.86E-11	=	[	2.8E-10	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Molybdenum	2.28E-09	=	[	3.5E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nickel	8.83E-09	=	[	1.3E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrate	7.67E-09	=	[	1.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Nitrite	1.97E-09	=	[	3.0E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Selenium	1.80E-09	=	[	2.7E-08	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Strontium	4.47E-08	=	[	6.8E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Total Uranium	5.56E-10	=	[	8.5E-09	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Vanadium	4.67E-08	=	[	7.1E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Zinc	4.08E-08	=	[	6.2E-07	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Acetone	5.57E-12	=	[	8.5E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Benzene	2.95E-13	=	[	4.5E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Styrene	3.40E-13	=	[	5.2E-12	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]
Toluene	6.65E-13	=	[	1.0E-11	x	72	x	8.0	x	7	]	/	[(	2,555	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Youth Trespasser
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Arsenic	4.64E-08	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	72	x	7	]	/	[	50	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Arsenic	4.64E-07	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	72	x	7	]	/	[	50	x	2,555	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	72	x	7	]	/	[	50	x	2,555	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Youth Trespasser Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.26E-04	x	0.00E+00	=	0.00E+00	3.26E-03	/	1.00E+00	=	3.26E-03
Antimony	1.15E-08	x	0.00E+00	=	0.00E+00	1.15E-07	/	4.00E-04	=	2.87E-04
Arsenic	2.76E-07	x	1.50E+00	=	4.14E-07	2.76E-06	/	3.00E-04	=	9.21E-03
Barium	3.82E-06	x	0.00E+00	=	0.00E+00	3.82E-05	/	2.00E-01	=	1.91E-04
Beryllium	9.27E-09	x	0.00E+00	=	0.00E+00	9.27E-08	/	2.00E-03	=	4.64E-05
Boron	2.53E-07	x	0.00E+00	=	0.00E+00	2.53E-06	/	2.00E-01	=	1.27E-05
Chromium	3.95E-07	x	0.00E+00	=	0.00E+00	3.95E-06	/	3.00E-03	=	1.32E-03
Cobalt	3.44E-07	x	0.00E+00	=	0.00E+00	3.44E-06	/	3.00E-04	=	1.15E-02
Copper	5.21E-07	x	0.00E+00	=	0.00E+00	5.21E-06	/	4.00E-02	=	1.30E-04
Fluoride	7.97E-08	x	0.00E+00	=	0.00E+00	7.97E-07	/	4.00E-02	=	1.99E-05
Iron	9.11E-04	x	0.00E+00	=	0.00E+00	9.11E-03	/	7.00E-01	=	1.30E-02
Lithium	3.65E-07	x	0.00E+00	=	0.00E+00	3.65E-06	/	2.00E-03	=	1.82E-03
Manganese	1.44E-05	x	0.00E+00	=	0.00E+00	1.44E-04	/	1.40E-01	=	1.03E-03
Mercury	8.13E-10	x	0.00E+00	=	0.00E+00	8.13E-09	/	0.00E+00	=	NA
Molybdenum	9.98E-08	x	0.00E+00	=	0.00E+00	9.98E-07	/	5.00E-03	=	2.00E-04
Nickel	3.87E-07	x	0.00E+00	=	0.00E+00	3.87E-06	/	2.00E-02	=	1.93E-04
Nitrate	3.36E-07	x	0.00E+00	=	0.00E+00	3.36E-06	/	1.60E+00	=	2.10E-06
Nitrite	8.64E-08	x	0.00E+00	=	0.00E+00	8.64E-07	/	1.00E-01	=	8.64E-06
Selenium	7.89E-08	x	0.00E+00	=	0.00E+00	7.89E-07	/	5.00E-03	=	1.58E-04
Strontium	1.96E-06	x	0.00E+00	=	0.00E+00	1.96E-05	/	6.00E-01	=	3.26E-05
Total Uranium	2.44E-08	x	0.00E+00	=	0.00E+00	2.44E-07	/	3.00E-03	=	8.12E-05
Vanadium	2.05E-06	x	0.00E+00	=	0.00E+00	2.05E-05	/	5.00E-03	=	4.10E-03
Zinc	1.79E-06	x	0.00E+00	=	0.00E+00	1.79E-05	/	3.00E-01	=	5.96E-05
Acetone	2.44E-10	x	0.00E+00	=	0.00E+00	2.44E-09	/	9.00E-01	=	2.71E-09
Benzene	1.29E-11	x	5.50E-02	=	7.12E-13	1.29E-10	/	4.00E-03	=	3.24E-08
Styrene	1.49E-11	x	0.00E+00	=	0.00E+00	1.49E-10	/	2.00E-01	=	7.44E-10
Toluene	2.91E-11	x	0.00E+00	=	0.00E+00	2.91E-10	/	8.00E-02	=	3.64E-09
			Pathway total	=	4.14E-07			Pathway total	=	4.66E-02

Inhalation of Chemicals in Soil

Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.45E-07	x		=	NA	7.45E-06	/[	5.00E-03	x	1000	]=	1.49E-06
Antimony	2.62E-11	x		=	NA	2.62E-10	/[		x	1000	]=	NA
Arsenic	6.31E-10	x	4.30E-03	=	2.71E-12	6.31E-09	/[	1.50E-05	x	1000	]=	4.20E-07
Barium	8.73E-09	x		=	NA	8.73E-08	/[	5.00E-04	x	1000	]=	1.75E-07
Beryllium	2.12E-11	x	2.40E-03	=	5.08E-14	2.12E-10	/[	2.00E-05	x	1000	]=	1.06E-08
Boron	5.78E-10	x	0.00E+00	=	0.00E+00	5.78E-09	/[	2.00E-02	x	1000	]=	2.89E-10
Chromium	9.01E-10	x	8.40E-02	=	7.57E-11	9.01E-09	/[	1.00E-04	x	1000	]=	9.01E-08
Cobalt	7.86E-10	x	9.00E-03	=	7.08E-12	7.86E-09	/[	6.00E-06	x	1000	]=	1.31E-06
Copper	1.19E-09	x		=	NA	1.19E-08	/[		x	1000	]=	NA
Fluoride	1.82E-10	x		=	NA	1.82E-09	/[	1.30E-02	x	1000	]=	1.40E-10
Iron	2.08E-06	x		=	NA	2.08E-05	/[		x	1000	]=	NA
Lithium	8.32E-10	x		=	NA	8.32E-09	/[		x	1000	]=	NA
Manganese	3.28E-08	x		=	NA	3.28E-07	/[	5.00E-05	x	1000	]=	6.56E-06
Mercury	1.86E-12	x	0.00E+00	=	0.00E+00	1.86E-11	/[	3.00E-04	x	1000	]=	6.19E-11
Molybdenum	2.28E-10	x	0.00E+00	=	0.00E+00	2.28E-09	/[	0.00E+00	x	1000	]=	NA
Nickel	8.83E-10	x	2.60E-04	=	2.30E-13	8.83E-09	/[	9.00E-05	x	1000	]=	9.81E-08
Nitrate	7.67E-10	x		=	NA	7.67E-09	/[		x	1000	]=	NA
Nitrite	1.97E-10	x		=	NA	1.97E-09	/[		x	1000	]=	NA
Selenium	1.80E-10	x	0.00E+00	=	0.00E+00	1.80E-09	/[	2.00E-02	x	1000	]=	9.01E-11
Strontium	4.47E-09	x		=	NA	4.47E-08	/[		x	1000	]=	NA
Total Uranium	5.56E-11	x		=	NA	5.56E-10	/[	4.00E-05	x	1000	]=	1.39E-08
Vanadium	4.67E-09	x		=	NA	4.67E-08	/[	1.00E-04	x	1000	]=	4.67E-07
Zinc	4.08E-09	x		=	NA	4.08E-08	/[		x	1000	]=	NA
Acetone	5.57E-13	x	0.00E+00	=	0.00E+00	5.57E-12	/[	3.10E+01	x	1000	]=	1.80E-16
Benzene	2.95E-14	x	7.80E-06	=	2.30E-19	2.95E-13	/[	3.00E-02	x	1000	]=	9.85E-15
Styrene	3.40E-14	x	0.00E+00	=	0.00E+00	3.40E-13	/[	1.00E+00	x	1000	]=	3.40E-16
Toluene	6.65E-14	x	0.00E+00	=	0.00E+00	6.65E-13	/[	5.00E+00	x	1000	]=	1.33E-16
			Pathway total =		8.57E-11					Pathway total =		1.06E-05

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.64E-08	x	1.50E+00	=	6.96E-08	4.64E-07	/	3.00E-04	=	1.55E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	1.60E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	1.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		6.96E-08			Pathway total =		1.55E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-04
Arsenic	Sum of all pathways	=	4.84E-07	Sum of all pathways	=	1.1E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Beryllium	Sum of all pathways	=	5.08E-14	Sum of all pathways	=	4.6E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Chromium	Sum of all pathways	=	7.57E-11	Sum of all pathways	=	1.3E-03
Cobalt	Sum of all pathways	=	7.08E-12	Sum of all pathways	=	1.1E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-11
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Nickel	Sum of all pathways	=	2.30E-13	Sum of all pathways	=	1.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-05
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-05
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-09
Benzene	Sum of all pathways	=	7.12E-13	Sum of all pathways	=	3.2E-08
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-10
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	4.84E-07

Total Noncarcinogenic Risk All Pathways and Chemicals	=	4.82E-02

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Youth Trespasser

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	2E-07	1E-06	3E-07	2E-07	3E-07	5E-07	2E-07	3E-07	3E-07	4E-07
Inhalation	8E-11	1E-10	1E-10	8E-11	1E-10	1E-10	8E-11	1E-10	1E-10	9E-11
Dermal Contact	4E-08	2E-07	5E-08	4E-08	5E-08	8E-08	4E-08	5E-08	6E-08	7E-08
ELCR	3E-07	1E-06	4E-07	3E-07	3E-07	5E-07	3E-07	4E-07	4E-07	5E-07
Major Risk Contributors	None									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	4E-02	8E-02	5E-02	4E-02	5E-02	5E-02	4E-02	5E-02	5E-02	5E-02
Inhalation	1E-05	1E-05	1E-05	1E-05	1E-05	1E-05	1E-05	1E-05	1E-05	1E-05
Dermal Contact	1E-03	5E-03	1E-03	8E-04	1E-03	2E-03	8E-04	1E-03	2E-03	2E-03
HI	0.04	0.08	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05
Major Hazard Contributors	None									

Appendix C

Attachment C-7: Results of Nonradiological Risk Assessment under Residential Adult Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.59E-03	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	9.09E-08	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.28E-06	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	2.91E-05	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	3.31E-08	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.27E-06	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.11E-06	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.37E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	7.62E-07	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.25E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.85E-06	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.21E-04	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	3.71E-06	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	3.10E-06	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	3.17E-07	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	1.65E-08	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.29E-05	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Tin	3.97E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	1.98E-07	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.05E-05	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.56E-05	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Diethylphthalate	1.16E-07	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-1254	2.58E-09	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	9.05E-03	=	[	7.55E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	3.18E-07	=	[	2.65E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	4.50E-06	=	[	3.75E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.02E-04	=	[	8.50E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.16E-07	=	[	9.67E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.14E-05	=	[	9.54E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.09E-05	=	[	9.09E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.53E-05	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	2.67E-06	=	[	2.23E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.89E-02	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	9.99E-06	=	[	8.33E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.24E-04	=	[	3.54E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.30E-05	=	[	1.08E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	1.09E-05	=	[	9.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	1.11E-06	=	[	9.25E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	5.79E-08	=	[	4.83E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	4.52E-05	=	[	3.77E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Tin	1.39E-05	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	6.92E-07	=	[	5.77E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	7.19E-05	=	[	6.00E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	5.46E-05	=	[	4.56E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Diethylphthalate	4.08E-07	=	[	3.40E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-1254	9.04E-09	=	[	7.54E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	2.83E-05	=	[	1.0E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	9.96E-10	=	[	3.6E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.41E-08	=	[	5.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.19E-07	=	[	1.2E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	3.63E-10	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	3.58E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.41E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.79E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	8.35E-09	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.04E-05	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.13E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.33E-06	=	[	4.8E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.07E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	3.40E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	3.47E-09	=	[	1.3E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	1.81E-10	=	[	6.6E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.42E-07	=	[	5.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Tin	4.35E-08	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.17E-09	=	[	7.9E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.25E-07	=	[	8.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.71E-07	=	[	6.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Diethylphthalate	1.28E-09	=	[	4.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Aroclor-1254	2.83E-11	=	[	1.0E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.92E-05	=	[	1.0E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.49E-09	=	[	3.6E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	4.93E-08	=	[	5.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.12E-06	=	[	1.2E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.27E-09	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.25E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.68E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	2.92E-08	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.16E-04	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.09E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	4.65E-06	=	[	4.8E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.42E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	1.22E-08	=	[	1.3E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	6.34E-10	=	[	6.6E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.96E-07	=	[	5.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Tin	1.52E-07	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	7.58E-09	=	[	7.9E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	7.88E-07	=	[	8.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	5.99E-07	=	[	6.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Diethylphthalate	4.47E-09	=	[	4.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Aroclor-1254	9.90E-11	=	[	1.0E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.63E-07	=	[	3.75E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.40E-10	=	[	9.67E-02	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Diethylphthalate	4.92E-08	=	[	3.40E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-1254	1.53E-09	=	[	7.54E-03	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	5.69E-07	=	[	3.75E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	4.90E-10	=	[	9.67E-02	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Diethylphthalate	1.72E-07	=	[	3.40E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-1254	5.34E-09	=	[	7.54E-03	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.59E-03	x	0.00E+00	=	0.00E+00	9.05E-03	/	1.00E+00	=	9.05E-03
Antimony	9.09E-08	x	0.00E+00	=	0.00E+00	3.18E-07	/	4.00E-04	=	7.95E-04
Arsenic	1.28E-06	x	1.50E+00	=	1.93E-06	4.50E-06	/	3.00E-04	=	1.50E-02
Barium	2.91E-05	x	0.00E+00	=	0.00E+00	1.02E-04	/	2.00E-01	=	5.09E-04
Cadmium	3.31E-08	x	0.00E+00	=	0.00E+00	1.16E-07	/	1.00E-03	=	1.16E-04
Chromium	3.27E-06	x	0.00E+00	=	0.00E+00	1.14E-05	/	3.00E-03	=	3.81E-03
Cobalt	3.11E-06	x	0.00E+00	=	0.00E+00	1.09E-05	/	3.00E-04	=	3.63E-02
Copper	4.37E-06	x	0.00E+00	=	0.00E+00	1.53E-05	/	4.00E-02	=	3.82E-04
Fluoride	7.62E-07	x	0.00E+00	=	0.00E+00	2.67E-06	/	4.00E-02	=	6.67E-05
Iron	8.25E-03	x	0.00E+00	=	0.00E+00	2.89E-02	/	7.00E-01	=	4.12E-02
Lithium	2.85E-06	x	0.00E+00	=	0.00E+00	9.99E-06	/	2.00E-03	=	4.99E-03
Manganese	1.21E-04	x	0.00E+00	=	0.00E+00	4.24E-04	/	1.40E-01	=	3.03E-03
Nickel	3.71E-06	x	0.00E+00	=	0.00E+00	1.30E-05	/	2.00E-02	=	6.50E-04
Nitrate	3.10E-06	x	0.00E+00	=	0.00E+00	1.09E-05	/	7.10E+00	=	1.53E-06
Nitrite	3.17E-07	x	0.00E+00	=	0.00E+00	1.11E-06	/	3.00E-01	=	3.70E-06
Silver	1.65E-08	x	0.00E+00	=	0.00E+00	5.79E-08	/	5.00E-03	=	1.16E-05
Strontium	1.29E-05	x	0.00E+00	=	0.00E+00	4.52E-05	/	6.00E-01	=	7.54E-05
Tin	3.97E-06	x	0.00E+00	=	0.00E+00	1.39E-05	/	6.00E-01	=	2.32E-05
Total Uranium	1.98E-07	x	0.00E+00	=	0.00E+00	6.92E-07	/	3.00E-03	=	2.31E-04
Vanadium	2.05E-05	x	0.00E+00	=	0.00E+00	7.19E-05	/	5.00E-03	=	1.44E-02
Zinc	1.56E-05	x	0.00E+00	=	0.00E+00	5.46E-05	/	3.00E-01	=	1.82E-04
Diethylphthalate	1.16E-07	x	0.00E+00	=	0.00E+00	4.08E-07	/	8.00E-01	=	5.09E-07
Aroclor-1254	2.58E-09	x	2.00E+00	=	5.16E-09	9.04E-09	/	2.00E-05	=	4.52E-04
			Pathway total	=	1.93E-06			Pathway total	=	1.31E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	2.83E-05	x		=	NA	9.92E-05	/[	5.00E-03	x	1000	]=	1.98E-05
Antimony	9.96E-10	x		=	NA	3.49E-09	/[		x	1000	]=	NA
Arsenic	1.41E-08	x	4.30E-03	=	6.05E-11	4.93E-08	/[	1.50E-05	x	1000	]=	3.28E-06
Barium	3.19E-07	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Cadmium	3.63E-10	x	1.80E-03	=	6.53E-13	1.27E-09	/[	1.00E-05	x	1000	]=	1.27E-07
Chromium	3.58E-08	x	8.40E-02	=	3.01E-09	1.25E-07	/[	1.00E-04	x	1000	]=	1.25E-06
Cobalt	3.41E-08	x	9.00E-03	=	3.07E-10	1.19E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	4.79E-08	x		=	NA	1.68E-07	/[		x	1000	]=	NA
Fluoride	8.35E-09	x		=	NA	2.92E-08	/[	1.30E-02	x	1000	]=	2.25E-09
Iron	9.04E-05	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	3.13E-08	x		=	NA	1.09E-07	/[		x	1000	]=	NA
Manganese	1.33E-06	x		=	NA	4.65E-06	/[	5.00E-05	x	1000	]=	9.30E-05
Nickel	4.07E-08	x	2.60E-04	=	1.06E-11	1.42E-07	/[	9.00E-05	x	1000	]=	1.58E-06
Nitrate	3.40E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Nitrite	3.47E-09	x		=	NA	1.22E-08	/[		x	1000	]=	NA
Silver	1.81E-10	x		=	NA	6.34E-10	/[		x	1000	]=	NA
Strontium	1.42E-07	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	4.35E-08	x		=	NA	1.52E-07	/[		x	1000	]=	NA
Total Uranium	2.17E-09	x		=	NA	7.58E-09	/[	4.00E-05	x	1000	]=	1.90E-07
Vanadium	2.25E-07	x		=	NA	7.88E-07	/[	1.00E-04	x	1000	]=	7.88E-06
Zinc	1.71E-07	x		=	NA	5.99E-07	/[		x	1000	]=	NA
Diethylphthalate	1.28E-09	x		=	NA	4.47E-09	/[		x	1000	]=	NA
Aroclor-1254	2.83E-11	x	5.70E-04	=	1.61E-14	9.90E-11	/[		x	1000	]=	NA
			Pathway total =		3.39E-09					Pathway total =		1.49E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.63E-07	x	1.50E+00	=	2.44E-07	5.69E-07	/	3.00E-04	=	1.90E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	1.40E-10	x		=	NA	4.90E-10	/	2.50E-05	=	1.96E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	4.92E-08	x		=	NA	1.72E-07	/	8.00E-01	=	2.15E-07
Aroclor-1254	1.53E-09	x	2.00E+00	=	3.05E-09	5.34E-09	/	2.00E-05	=	2.67E-04
			Pathway total =		2.47E-07			Pathway total =		2.19E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-04
Arsenic	Sum of all pathways	=	2.17E-06	Sum of all pathways	=	1.7E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-04
Cadmium	Sum of all pathways	=	6.53E-13	Sum of all pathways	=	1.4E-04
Chromium	Sum of all pathways	=	3.01E-09	Sum of all pathways	=	3.8E-03
Cobalt	Sum of all pathways	=	3.07E-10	Sum of all pathways	=	3.6E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-03
Nickel	Sum of all pathways	=	1.06E-11	Sum of all pathways	=	6.5E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-07
Aroclor-1254	Sum of all pathways	=	8.22E-09	Sum of all pathways	=	7.2E-04

Total Carcinogenic Risk		
All Pathways and Chemicals	=	2.18E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.34E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.26E-03	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	2.47E-07	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	7.26E-06	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	3.38E-05	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	1.38E-07	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	5.14E-08	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	4.38E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.77E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	6.20E-06	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	7.84E-07	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	9.79E-03	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	4.14E-06	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.54E-04	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	1.73E-09	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	4.45E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	5.96E-06	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	7.23E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.74E-08	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.53E-05	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.90E-07	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.69E-05	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.75E-05	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.76E-08	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	1.14E-02	=	[	9.51E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	8.64E-07	=	[	7.21E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	2.54E-05	=	[	2.12E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.18E-04	=	[	9.88E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	4.83E-07	=	[	4.03E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.80E-07	=	[	1.50E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.53E-05	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.32E-05	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	2.17E-05	=	[	1.81E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	2.74E-06	=	[	2.29E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	3.43E-02	=	[	2.86E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.45E-05	=	[	1.21E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	5.38E-04	=	[	4.49E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	6.07E-09	=	[	5.06E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.56E-05	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	2.09E-05	=	[	1.74E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	2.53E-06	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	9.59E-08	=	[	8.00E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	5.36E-05	=	[	4.47E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	1.01E-06	=	[	8.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	9.41E-05	=	[	7.85E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	6.13E-05	=	[	5.11E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	9.67E-08	=	[	8.07E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	3.57E-05	=	[	1.3E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	2.71E-09	=	[	9.9E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	7.96E-08	=	[	2.9E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.71E-07	=	[	1.4E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	1.51E-09	=	[	5.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	5.63E-10	=	[	2.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	4.80E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	4.13E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	6.79E-08	=	[	2.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	8.59E-09	=	[	3.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	1.07E-04	=	[	3.9E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	4.54E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.69E-06	=	[	6.2E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	1.90E-11	=	[	6.9E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.88E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	6.53E-08	=	[	2.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	7.92E-09	=	[	2.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	3.00E-10	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.68E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	3.17E-09	=	[	1.2E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.95E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.92E-07	=	[	7.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	3.03E-10	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.25E-04	=	[	1.3E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	9.47E-09	=	[	9.9E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	2.78E-07	=	[	2.9E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.30E-06	=	[	1.4E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	5.29E-09	=	[	5.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.97E-09	=	[	2.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.68E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.44E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	2.38E-07	=	[	2.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	3.01E-08	=	[	3.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.76E-04	=	[	3.9E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.59E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	5.90E-06	=	[	6.2E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	6.65E-11	=	[	6.9E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.71E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	2.29E-07	=	[	2.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	2.77E-08	=	[	2.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	1.05E-09	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	5.87E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	1.11E-08	=	[	1.2E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	1.03E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	6.71E-07	=	[	7.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	1.06E-09	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	9.20E-07	=	[	2.12E+01	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	2.17E-10	=	[	1.50E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.17E-08	=	[	8.07E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	3.22E-06	=	[	2.12E+01	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	7.59E-10	=	[	1.50E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	4.08E-08	=	[	8.07E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.26E-03	x	0.00E+00	=	0.00E+00	1.14E-02	/	1.00E+00	=	1.14E-02
Antimony	2.47E-07	x	0.00E+00	=	0.00E+00	8.64E-07	/	4.00E-04	=	2.16E-03
Arsenic	7.26E-06	x	1.50E+00	=	1.09E-05	2.54E-05	/	3.00E-04	=	8.47E-02
Barium	3.38E-05	x	0.00E+00	=	0.00E+00	1.18E-04	/	2.00E-01	=	5.92E-04
Beryllium	1.38E-07	x	0.00E+00	=	0.00E+00	4.83E-07	/	2.00E-03	=	2.42E-04
Cadmium	5.14E-08	x	0.00E+00	=	0.00E+00	1.80E-07	/	1.00E-03	=	1.80E-04
Chromium	4.38E-06	x	0.00E+00	=	0.00E+00	1.53E-05	/	3.00E-03	=	5.11E-03
Cobalt	3.77E-06	x	0.00E+00	=	0.00E+00	1.32E-05	/	3.00E-04	=	4.39E-02
Copper	6.20E-06	x	0.00E+00	=	0.00E+00	2.17E-05	/	4.00E-02	=	5.42E-04
Fluoride	7.84E-07	x	0.00E+00	=	0.00E+00	2.74E-06	/	4.00E-02	=	6.86E-05
Iron	9.79E-03	x	0.00E+00	=	0.00E+00	3.43E-02	/	7.00E-01	=	4.90E-02
Lithium	4.14E-06	x	0.00E+00	=	0.00E+00	1.45E-05	/	2.00E-03	=	7.25E-03
Manganese	1.54E-04	x	0.00E+00	=	0.00E+00	5.38E-04	/	1.40E-01	=	3.84E-03
Mercury	1.73E-09	x	0.00E+00	=	0.00E+00	6.07E-09	/	0.00E+00	=	**NA**
Nickel	4.45E-06	x	0.00E+00	=	0.00E+00	1.56E-05	/	2.00E-02	=	7.79E-04
Nitrate	5.96E-06	x	0.00E+00	=	0.00E+00	2.09E-05	/	7.10E+00	=	2.94E-06
Nitrite	7.23E-07	x	0.00E+00	=	0.00E+00	2.53E-06	/	3.00E-01	=	8.43E-06
Silver	2.74E-08	x	0.00E+00	=	0.00E+00	9.59E-08	/	5.00E-03	=	1.92E-05
Strontium	1.53E-05	x	0.00E+00	=	0.00E+00	5.36E-05	/	6.00E-01	=	8.93E-05
Total Uranium	2.90E-07	x	0.00E+00	=	0.00E+00	1.01E-06	/	3.00E-03	=	3.38E-04
Vanadium	2.69E-05	x	0.00E+00	=	0.00E+00	9.41E-05	/	5.00E-03	=	1.88E-02
Zinc	1.75E-05	x	0.00E+00			6.13E-05	/	3.00E-01	=	2.04E-04
Butylbenzylphthalate	2.76E-08	x	1.90E-03	=	5.25E-11	9.67E-08	/	2.00E-01	=	4.84E-07
			Pathway total	=	1.09E-05			Pathway total	=	2.29E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	3.57E-05	x		=	NA	1.25E-04	/[	5.00E-03	x	1000	]=	2.50E-05
Antimony	2.71E-09	x		=	NA	9.47E-09	/[		x	1000	]=	NA
Arsenic	7.96E-08	x	4.30E-03	=	3.42E-10	2.78E-07	/[	1.50E-05	x	1000	]=	1.86E-05
Barium	3.71E-07	x		=	NA	1.30E-06	/[	5.00E-04	x	1000	]=	2.60E-06
Beryllium	1.51E-09	x	2.40E-03	=	3.63E-12	5.29E-09	/[	2.00E-05	x	1000	]=	2.65E-07
Cadmium	5.63E-10	x	1.80E-03	=	1.01E-12	1.97E-09	/[	1.00E-05	x	1000	]=	1.97E-07
Chromium	4.80E-08	x	8.40E-02	=	4.04E-09	1.68E-07	/[	1.00E-04	x	1000	]=	1.68E-06
Cobalt	4.13E-08	x	9.00E-03	=	3.72E-10	1.44E-07	/[	6.00E-06	x	1000	]=	2.41E-05
Copper	6.79E-08	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Fluoride	8.59E-09	x		=	NA	3.01E-08	/[	1.30E-02	x	1000	]=	2.31E-09
Iron	1.07E-04	x		=	NA	3.76E-04	/[		x	1000	]=	NA
Lithium	4.54E-08	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Manganese	1.69E-06	x		=	NA	5.90E-06	/[	5.00E-05	x	1000	]=	1.18E-04
Mercury	1.90E-11	x	0.00E+00	=	0.00E+00	6.65E-11	/[	3.00E-04	x	1000	]=	2.22E-10
Nickel	4.88E-08	x	2.60E-04	=	1.27E-11	1.71E-07	/[	9.00E-05	x	1000	]=	1.90E-06
Nitrate	6.53E-08	x		=	NA	2.29E-07	/[		x	1000	]=	NA
Nitrite	7.92E-09	x		=	NA	2.77E-08	/[		x	1000	]=	NA
Silver	3.00E-10	x		=	NA	1.05E-09	/[		x	1000	]=	NA
Strontium	1.68E-07	x		=	NA	5.87E-07	/[		x	1000	]=	NA
Total Uranium	3.17E-09	x		=	NA	1.11E-08	/[	4.00E-05	x	1000	]=	2.78E-07
Vanadium	2.95E-07	x		=	NA	1.03E-06	/[	1.00E-04	x	1000	]=	1.03E-05
Zinc	1.92E-07	x				6.71E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	3.03E-10	x	0.00E+00	=	0.00E+00	1.06E-09	/		x	1000	]=	NA
			Pathway total =		4.77E-09					Pathway total =		2.03E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.20E-07	x	1.50E+00	=	1.38E-06	3.22E-06	/	3.00E-04	=	1.07E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.17E-10	x		=	NA	7.59E-10	/	2.50E-05	=	3.04E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.17E-08	x	1.90E-03	=	2.22E-11	4.08E-08	/	2.00E-01	=	2.04E-07
			Pathway total =		1.38E-06			Pathway total =		1.08E-02

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03
Arsenic	Sum of all pathways	=	1.23E-05	Sum of all pathways	=	9.5E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-04
Beryllium	Sum of all pathways	=	3.63E-12	Sum of all pathways	=	2.4E-04
Cadmium	Sum of all pathways	=	1.01E-12	Sum of all pathways	=	2.1E-04
Chromium	Sum of all pathways	=	4.04E-09	Sum of all pathways	=	5.1E-03
Cobalt	Sum of all pathways	=	3.72E-10	Sum of all pathways	=	4.4E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-10
Nickel	Sum of all pathways	=	1.27E-11	Sum of all pathways	=	7.8E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-06
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	8.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04
Butylbenzylphthalate	Sum of all pathways	=	7.47E-11	Sum of all pathways	=	6.9E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	**1E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	2.40E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.54E-03	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	6.10E-08	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.78E-06	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	2.68E-05	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	5.45E-08	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Boron	1.14E-06	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.12E-06	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	5.89E-06	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.02E-06	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	5.65E-06	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	5.07E-07	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.29E-03	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	3.13E-06	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.70E-04	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	7.95E-09	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	4.25E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	1.72E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	4.79E-07	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	1.92E-07	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.91E-08	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.19E-05	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.83E-07	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.01E-05	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.53E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	2.27E-09	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	4.25E-08	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	1.15E-10	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Aldrin	6.85E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	8.89E-03	=	[	7.42E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	2.13E-07	=	[	1.78E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	6.23E-06	=	[	5.20E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	9.40E-05	=	[	7.84E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	1.91E-07	=	[	1.59E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Boron	4.00E-06	=	[	3.34E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	3.91E-06	=	[	3.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	2.06E-05	=	[	1.72E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.06E-05	=	[	8.82E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.98E-05	=	[	1.65E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	1.77E-06	=	[	1.48E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.90E-02	=	[	2.42E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.09E-05	=	[	9.13E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	5.93E-04	=	[	4.95E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	2.78E-08	=	[	2.32E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.49E-05	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	6.02E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	1.68E-06	=	[	1.40E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	6.71E-07	=	[	5.60E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	1.02E-07	=	[	8.50E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	4.16E-05	=	[	3.47E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	9.91E-07	=	[	8.27E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	7.05E-05	=	[	5.88E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	5.37E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	7.95E-09	=	[	6.63E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	1.49E-07	=	[	1.24E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	4.04E-10	=	[	3.37E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Aldrin	2.40E-09	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.78E-05	=	[	1.0E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	6.68E-10	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.95E-08	=	[	7.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	2.94E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	5.97E-10	=	[	2.2E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Boron	1.25E-08	=	[	4.6E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	1.22E-08	=	[	4.5E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	6.46E-08	=	[	2.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.31E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	6.19E-08	=	[	2.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	5.55E-09	=	[	2.0E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.08E-05	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.43E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.86E-06	=	[	6.8E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	8.71E-11	=	[	3.2E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.65E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	1.88E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	5.25E-09	=	[	1.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Selenium	2.10E-09	=	[	7.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	3.19E-10	=	[	1.2E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.30E-07	=	[	4.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	3.10E-09	=	[	1.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.21E-07	=	[	8.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.68E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Acetone	2.49E-11	=	[	9.1E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.65E-10	=	[	1.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	1.26E-12	=	[	4.6E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Aldrin	7.51E-12	=	[	2.7E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.75E-05	=	[	1.0E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	2.34E-09	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	6.83E-08	=	[	7.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.03E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	2.09E-09	=	[	2.2E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Boron	4.39E-08	=	[	4.6E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	4.28E-08	=	[	4.5E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	2.26E-07	=	[	2.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.16E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	2.17E-07	=	[	2.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	1.94E-08	=	[	2.0E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.18E-04	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.20E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	6.50E-06	=	[	6.8E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	3.05E-10	=	[	3.2E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.63E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	6.59E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	1.84E-08	=	[	1.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Selenium	7.36E-09	=	[	7.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	1.12E-09	=	[	1.2E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.56E-07	=	[	4.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	1.09E-08	=	[	1.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	7.72E-07	=	[	8.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	5.88E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Acetone	8.71E-11	=	[	9.1E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	1.63E-09	=	[	1.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	4.43E-12	=	[	4.6E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Aldrin	2.63E-11	=	[	2.7E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.26E-07	=	[	5.20E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	4.71E-09	=	[	3.26E+00	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.79E-08	=	[	1.24E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Aldrin	2.89E-10	=	[	2.00E-03	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	7.90E-07	=	[	5.20E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.65E-08	=	[	3.26E+00	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	6.28E-08	=	[	1.24E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Aldrin	1.01E-09	=	[	2.00E-03	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.54E-03	x	0.00E+00	=	0.00E+00	8.89E-03	/	1.00E+00	=	8.89E-03
Antimony	6.10E-08	x	0.00E+00	=	0.00E+00	2.13E-07	/	4.00E-04	=	5.33E-04
Arsenic	1.78E-06	x	1.50E+00	=	2.67E-06	6.23E-06	/	3.00E-04	=	2.08E-02
Barium	2.68E-05	x	0.00E+00	=	0.00E+00	9.40E-05	/	2.00E-01	=	4.70E-04
Beryllium	5.45E-08	x	0.00E+00	=	0.00E+00	1.91E-07	/	2.00E-03	=	9.53E-05
Boron	1.14E-06	x	0.00E+00	=	0.00E+00	4.00E-06	/	2.00E-01	=	2.00E-05
Cadmium	1.12E-06	x	0.00E+00	=	0.00E+00	3.91E-06	/	1.00E-03	=	3.91E-03
Chromium	5.89E-06	x	0.00E+00	=	0.00E+00	2.06E-05	/	3.00E-03	=	6.87E-03
Cobalt	3.02E-06	x	0.00E+00	=	0.00E+00	1.06E-05	/	3.00E-04	=	3.52E-02
Copper	5.65E-06	x	0.00E+00	=	0.00E+00	1.98E-05	/	4.00E-02	=	4.94E-04
Fluoride	5.07E-07	x	0.00E+00	=	0.00E+00	1.77E-06	/	4.00E-02	=	4.43E-05
Iron	8.29E-03	x	0.00E+00	=	0.00E+00	2.90E-02	/	7.00E-01	=	4.14E-02
Lithium	3.13E-06	x	0.00E+00	=	0.00E+00	1.09E-05	/	2.00E-03	=	5.47E-03
Manganese	1.70E-04	x	0.00E+00	=	0.00E+00	5.93E-04	/	1.40E-01	=	4.24E-03
Mercury	7.95E-09	x	0.00E+00	=	0.00E+00	2.78E-08	/	0.00E+00	=	NA
Nickel	4.25E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	2.00E-02	=	7.43E-04
Nitrate	1.72E-06	x	0.00E+00	=	0.00E+00	6.02E-06	/	7.10E+00	=	8.47E-07
Nitrite	4.79E-07	x	0.00E+00	=	0.00E+00	1.68E-06	/	3.00E-01	=	5.59E-06
Selenium	1.92E-07	x	0.00E+00	=	0.00E+00	6.71E-07	/	5.00E-03	=	1.34E-04
Silver	2.91E-08	x	0.00E+00	=	0.00E+00	1.02E-07	/	5.00E-03	=	2.04E-05
Strontium	1.19E-05	x	0.00E+00	=	0.00E+00	4.16E-05	/	6.00E-01	=	6.93E-05
Total Uranium	2.83E-07	x	0.00E+00	=	0.00E+00	9.91E-07	/	3.00E-03	=	3.30E-04
Vanadium	2.01E-05	x	0.00E+00	=	0.00E+00	7.05E-05	/	5.00E-03	=	1.41E-02
Zinc	1.53E-05	x	0.00E+00	=	0.00E+00	5.37E-05	/	3.00E-01	=	1.79E-04
Acetone	2.27E-09	x	0.00E+00	=	0.00E+00	7.95E-09	/	9.00E-01	=	8.83E-09
Butylbenzylphthalate	4.25E-08	x	1.90E-03	=	8.07E-11	1.49E-07	/	2.00E-01	=	7.43E-07
Toluene	1.15E-10	x	0.00E+00	=	0.00E+00	4.04E-10	/	8.00E-02	=	5.05E-09
Aldrin	6.85E-10	x	1.70E+01	=	1.16E-08	2.40E-09	/	3.00E-05	=	7.99E-05
			Pathway total	=	2.68E-06			Pathway total	=	1.44E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	2.78E-05	x		=	NA	9.75E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	6.68E-10	x		=	NA	2.34E-09	/[		x	1000	]=	NA
Arsenic	1.95E-08	x	4.30E-03	=	8.39E-11	6.83E-08	/[	1.50E-05	x	1000	]=	4.55E-06
Barium	2.94E-07	x		=	NA	1.03E-06	/[	5.00E-04	x	1000	]=	2.06E-06
Beryllium	5.97E-10	x	2.40E-03	=	1.43E-12	2.09E-09	/[	2.00E-05	x	1000	]=	1.04E-07
Boron	1.25E-08	x	0.00E+00	=	0.00E+00	4.39E-08	/[	2.00E-02	x	1000	]=	2.19E-09
Cadmium	1.22E-08	x	1.80E-03	=	2.20E-11	4.28E-08	/[	1.00E-05	x	1001	]=	4.28E-06
Chromium	6.46E-08	x	8.40E-02	=	5.42E-09	2.26E-07	/[	1.00E-04	x	1002	]=	2.25E-06
Cobalt	3.31E-08	x	9.00E-03	=	2.98E-10	1.16E-07	/[	6.00E-06	x	1003	]=	1.93E-05
Copper	6.19E-08	x		=	NA	2.17E-07	/[		x	1004	]=	NA
Fluoride	5.55E-09	x		=	NA	1.94E-08	/[	1.30E-02	x	1005	]=	1.49E-09
Iron	9.08E-05	x		=	NA	3.18E-04	/[		x	1000	]=	NA
Lithium	3.43E-08	x		=	NA	1.20E-07	/[		x	1000	]=	NA
Manganese	1.86E-06	x		=	NA	6.50E-06	/[	5.00E-05	x	1000	]=	1.30E-04
Mercury	8.71E-11	x	0.00E+00	=	0.00E+00	3.05E-10	/[	3.00E-04	x	1000	]=	1.02E-09
Nickel	4.65E-08	x	2.60E-04	=	1.21E-11	1.63E-07	/[	9.00E-05	x	1000	]=	1.81E-06
Nitrate	1.88E-08	x		=	NA	6.59E-08	/[		x	1000	]=	NA
Nitrite	5.25E-09	x		=	NA	1.84E-08	/[		x	1000	]=	NA
Selenium	2.10E-09	x	0.00E+00	=	0.00E+00	7.36E-09	/[	2.00E-02	x	1000	]=	3.68E-10
Silver	3.19E-10	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	1.30E-07	x		=	NA	4.56E-07	/[		x	1000	]=	NA
Total Uranium	3.10E-09	x		=	NA	1.09E-08	/[	4.00E-05	x	1000	]=	2.72E-07
Vanadium	2.21E-07	x		=	NA	7.72E-07	/[	1.00E-04	x	1000	]=	7.72E-06
Zinc	1.68E-07	x		=	NA	5.88E-07	/[		x	1000	]=	NA
Acetone	2.49E-11	x	0.00E+00	=	0.00E+00	8.71E-11	/[	3.10E+01	x	1000	]=	2.81E-15
Butylbenzylphthalate	4.65E-10	x	0.00E+00	=	0.00E+00	1.63E-09	/[		x	1000	]=	NA
Toluene	1.26E-12	x	0.00E+00	=	0.00E+00	4.43E-12	/[	5.00E+00	x	1000	]=	8.85E-16
Aldrin	7.51E-12	x	4.90E-03	=	3.68E-14	2.63E-11	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		5.84E-09					Pathway total =		1.92E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.26E-07	x	1.50E+00	=	3.38E-07	7.90E-07	/	3.00E-04	=	2.63E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	4.71E-09	x		=	NA	1.65E-08	/	2.50E-05	=	6.60E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.79E-08	x	1.90E-03	=	3.41E-11	6.28E-08	/	2.00E-01	=	3.14E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	2.89E-10	x	1.70E+01	=	4.92E-09	1.01E-09	/	3.00E-05	=	3.37E-05
			Pathway total =		3.43E-07			Pathway total =		3.33E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	8.9E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-04
Arsenic	Sum of all pathways	=	3.01E-06	Sum of all pathways	=	2.3E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-04
Beryllium	Sum of all pathways	=	1.43E-12	Sum of all pathways	=	9.5E-05
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Cadmium	Sum of all pathways	=	2.20E-11	Sum of all pathways	=	4.6E-03
Chromium	Sum of all pathways	=	5.42E-09	Sum of all pathways	=	6.9E-03
Cobalt	Sum of all pathways	=	2.98E-10	Sum of all pathways	=	3.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-09
Nickel	Sum of all pathways	=	1.21E-11	Sum of all pathways	=	7.4E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	8.5E-07
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.6E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	6.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-09
Butylbenzylphthalate	Sum of all pathways	=	1.15E-10	Sum of all pathways	=	1.1E-06
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-09
Aldrin	Sum of all pathways	=	1.66E-08	Sum of all pathways	=	1.1E-04

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.03E-06	All Pathways and Chemicals	=	1.48E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.32E-03	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	8.46E-08	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.19E-06	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	3.22E-05	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	1.02E-07	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	3.99E-08	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.07E-06	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	2.80E-06	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.46E-06	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	7.23E-07	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.20E-03	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.54E-06	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.32E-04	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	1.04E-08	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	3.85E-06	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	2.45E-06	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	1.05E-06	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.80E-08	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.24E-05	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Tin	2.18E-06	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.45E-07	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.39E-05	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.31E-05	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
2-Butanone	8.51E-10	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.38E-06	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.03E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Hexane	1.23E-08	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	6.85E-10	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
o-Xylene	4.38E-11	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	2.24E-10	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	3.35E-10	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Xylenes (total)	1.59E-10	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	8.64E-09	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Gamma-BHC (Lindane)	1.75E-09	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-12200	7.05E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation Units	CDIingestion mg/kg-day	=	[	C_S mg/kg	x	IR_S mg soil/day	x	FI unitless	x	CF1 kg/mg	x	EF days/year	x	ED years	]	/	[	BW kg	x	AT days	]
NONCARCINOGENIC EFFECTS																					
Aluminum	8.10E-03	=	[	6.76E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	2.96E-07	=	[	2.47E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	4.18E-06	=	[	3.49E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.13E-04	=	[	9.41E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	3.57E-07	=	[	2.98E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.40E-07	=	[	1.17E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.08E-05	=	[	8.98E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	9.81E-06	=	[	8.18E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.56E-05	=	[	1.30E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	2.53E-06	=	[	2.11E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.87E-02	=	[	2.39E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	8.90E-06	=	[	7.43E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.63E-04	=	[	3.86E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	3.64E-08	=	[	3.04E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.35E-05	=	[	1.13E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	8.58E-06	=	[	7.15E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	3.67E-06	=	[	3.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	9.80E-08	=	[	8.18E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	4.34E-05	=	[	3.62E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Tin	7.62E-06	=	[	6.36E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	8.57E-07	=	[	7.15E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	8.36E-05	=	[	6.97E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	4.60E-05	=	[	3.83E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
2-Butanone	2.98E-09	=	[	2.48E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	4.83E-06	=	[	4.03E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	7.10E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Hexane	4.30E-08	=	[	3.59E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	2.40E-09	=	[	2.00E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
o-Xylene	1.53E-10	=	[	1.28E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	7.84E-10	=	[	6.54E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	1.17E-09	=	[	9.78E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Xylenes (total)	5.55E-10	=	[	4.63E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	3.03E-08	=	[	2.52E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Gamma-BHC (Lindane)	6.11E-09	=	[	5.10E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-12200	2.47E-08	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.54E-05	=	[	9.3E-05	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	9.27E-10	=	[	3.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.31E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.53E-07	=	[	1.3E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	1.12E-09	=	[	4.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	4.37E-10	=	[	1.6E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	3.37E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.07E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.89E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	7.93E-09	=	[	2.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	8.99E-05	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	2.79E-08	=	[	1.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.45E-06	=	[	5.3E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	1.14E-10	=	[	4.2E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.22E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	2.69E-08	=	[	9.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	1.15E-08	=	[	4.2E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	3.07E-10	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.36E-07	=	[	5.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Tin	2.39E-08	=	[	8.7E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.68E-09	=	[	9.8E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.62E-07	=	[	9.6E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.44E-07	=	[	5.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
2-Butanone	9.33E-12	=	[	3.4E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	1.51E-08	=	[	5.5E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.22E-10	=	[	8.1E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Hexane	1.35E-10	=	[	4.9E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Methylene chloride	7.51E-12	=	[	2.7E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
o-Xylene	4.80E-13	=	[	1.8E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Styrene	2.45E-12	=	[	9.0E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	3.67E-12	=	[	1.3E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Xylenes (total)	1.74E-12	=	[	6.3E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
beta-BHC	9.47E-11	=	[	3.5E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	1.91E-11	=	[	7.0E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Aroclor-12200	7.73E-11	=	[	2.8E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.88E-05	=	[	9.3E-05	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.25E-09	=	[	3.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	4.58E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.24E-06	=	[	1.3E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	3.91E-09	=	[	4.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.53E-09	=	[	1.6E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.18E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.07E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.71E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	2.77E-08	=	[	2.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.15E-04	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	9.76E-08	=	[	1.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	5.07E-06	=	[	5.3E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	3.99E-10	=	[	4.2E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.48E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	9.40E-08	=	[	9.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	4.02E-08	=	[	4.2E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	1.07E-09	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.75E-07	=	[	5.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Tin	8.35E-08	=	[	8.7E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	9.40E-09	=	[	9.8E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	9.16E-07	=	[	9.6E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	5.04E-07	=	[	5.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
2-Butanone	3.26E-11	=	[	3.4E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Bis(2-ethylhexyl) phthalate	5.30E-08	=	[	5.5E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	7.78E-10	=	[	8.1E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Hexane	4.72E-10	=	[	4.9E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Methylene chloride	2.63E-11	=	[	2.7E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
o-Xylene	1.68E-12	=	[	1.8E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Styrene	8.59E-12	=	[	9.0E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	1.28E-11	=	[	1.3E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Xylenes (total)	6.08E-12	=	[	6.3E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
beta-BHC	3.32E-10	=	[	3.5E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Gamma-BHC (Lindane)	6.70E-11	=	[	7.0E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Aroclor-12200	2.71E-10	=	[	2.8E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.51E-07	=	[	3.49E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.69E-10	=	[	1.17E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.83E-07	=	[	4.03E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	8.56E-09	=	[	5.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	3.65E-09	=	[	2.52E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Gamma-BHC (Lindane)	2.95E-10	=	[	5.10E-03	x	1.00E-06	x	6,032	x	0.07	x	0.04	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-1260	4.17E-09	=	[	2.06E-02	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	5.30E-07	=	[	3.49E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	5.90E-10	=	[	1.17E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	2.04E-06	=	[	4.03E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	3.00E-08	=	[	5.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	1.28E-08	=	[	2.52E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Gamma-BHC (Lindane)	1.03E-09	=	[	5.10E-03	x	1.00E-06	x	6,032	x	0.07	x	0.04	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-1260	1.46E-08	=	[	2.06E-02	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.32E-03	x	0.00E+00	=	0.00E+00	8.10E-03	/	1.00E+00	=	8.10E-03
Antimony	8.46E-08	x	0.00E+00	=	0.00E+00	2.96E-07	/	4.00E-04	=	7.41E-04
Arsenic	1.19E-06	x	1.50E+00	=	1.79E-06	4.18E-06	/	3.00E-04	=	1.39E-02
Barium	3.22E-05	x	0.00E+00	=	0.00E+00	1.13E-04	/	2.00E-01	=	5.64E-04
Beryllium	1.02E-07	x	0.00E+00	=	0.00E+00	3.57E-07	/	2.00E-03	=	1.79E-04
Cadmium	3.99E-08	x	0.00E+00	=	0.00E+00	1.40E-07	/	1.00E-03	=	1.40E-04
Chromium	3.07E-06	x	0.00E+00	=	0.00E+00	1.08E-05	/	3.00E-03	=	3.59E-03
Cobalt	2.80E-06	x	0.00E+00	=	0.00E+00	9.81E-06	/	3.00E-04	=	3.27E-02
Copper	4.46E-06	x	0.00E+00	=	0.00E+00	1.56E-05	/	4.00E-02	=	3.90E-04
Fluoride	7.23E-07	x	0.00E+00	=	0.00E+00	2.53E-06	/	4.00E-02	=	6.33E-05
Iron	8.20E-03	x	0.00E+00	=	0.00E+00	2.87E-02	/	7.00E-01	=	4.10E-02
Lithium	2.54E-06	x	0.00E+00	=	0.00E+00	8.90E-06	/	2.00E-03	=	4.45E-03
Manganese	1.32E-04	x	0.00E+00	=	0.00E+00	4.63E-04	/	1.40E-01	=	3.31E-03
Mercury	1.04E-08	x	0.00E+00	=	0.00E+00	3.64E-08	/	0.00E+00	=	NA
Nickel	3.85E-06	x	0.00E+00	=	0.00E+00	1.35E-05	/	2.00E-02	=	6.74E-04
Nitrate	2.45E-06	x	0.00E+00	=	0.00E+00	8.58E-06	/	7.10E+00	=	1.21E-06
Nitrite	1.05E-06	x	0.00E+00	=	0.00E+00	3.67E-06	/	3.00E-01	=	1.22E-05
Silver	2.80E-08	x	0.00E+00	=	0.00E+00	9.80E-08	/	5.00E-03	=	1.96E-05
Strontium	1.24E-05	x	0.00E+00	=	0.00E+00	4.34E-05	/	6.00E-01	=	7.23E-05
Tin	2.18E-06	x	0.00E+00	=	0.00E+00	7.62E-06	/	6.00E-01	=	1.27E-05
Total Uranium	2.45E-07	x	0.00E+00	=	0.00E+00	8.57E-07	/	3.00E-03	=	2.86E-04
Vanadium	2.39E-05	x	0.00E+00	=	0.00E+00	8.36E-05	/	5.00E-03	=	1.67E-02
Zinc	1.31E-05	x	0.00E+00	=	0.00E+00	4.60E-05	/	3.00E-01	=	1.53E-04
2-Butanone	8.51E-10	x	0.00E+00	=	0.00E+00	2.98E-09	/	6.00E-01	=	4.96E-09
Bis(2-ethylhexyl) phthalate	1.38E-06	x	1.40E-02	=	1.93E-08	4.83E-06	/	2.00E-02	=	2.42E-04
Butylbenzylphthalate	2.03E-08	x	1.90E-03	=	3.85E-11	7.10E-08	/	2.00E-01	=	3.55E-07
Hexane	1.23E-08	x	0.00E+00	=	0.00E+00	4.30E-08	/	6.00E-02	=	7.17E-07
Methylene chloride	6.85E-10	x	2.00E-03	=	1.37E-12	2.40E-09	/	6.00E-03	=	4.00E-07
o-Xylene	4.38E-11	x	0.00E+00	=	0.00E+00	1.53E-10	/	2.00E-01	=	7.67E-10
Styrene	2.24E-10	x	0.00E+00	=	0.00E+00	7.84E-10	/	2.00E-01	=	3.92E-09
Toluene	3.35E-10	x	0.00E+00	=	0.00E+00	1.17E-09	/	8.00E-02	=	1.47E-08
Xylenes (total)	1.59E-10	x	0.00E+00	=	0.00E+00	5.55E-10	/	2.00E-01	=	2.77E-09
beta-BHC	8.64E-09	x	1.80E+00	=	1.56E-08	3.03E-08	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	1.75E-09	x	1.10E+00	=	1.92E-09	6.11E-09	/	3.00E-04	=	2.04E-05
Aroclor-1260	7.05E-09	x	2.00E+00	=	1.41E-08	2.47E-08	/	0.00E+00	=	NA
			Pathway total	=	1.84E-06			Pathway total	=	1.27E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	2.54E-05	x		=	NA	8.88E-05	/[	5.00E-03	x	1000	]=	1.78E-05
Antimony	9.27E-10	x		=	NA	3.25E-09	/[		x	1000	]=	NA
Arsenic	1.31E-08	x	4.30E-03	=	5.63E-11	4.58E-08	/[	1.50E-05	x	1000	]=	3.05E-06
Barium	3.53E-07	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.47E-06
Beryllium	1.12E-09	x	2.40E-03	=	2.68E-12	3.91E-09	/[	2.00E-05	x	1000	]=	1.96E-07
Cadmium	4.37E-10	x	1.80E-03	=	7.87E-13	1.53E-09	/[	1.00E-05	x	1000	]=	1.53E-07
Chromium	3.37E-08	x	8.40E-02	=	2.83E-09	1.18E-07	/[	1.00E-04	x	1000	]=	1.18E-06
Cobalt	3.07E-08	x	9.00E-03	=	2.76E-10	1.07E-07	/[	6.00E-06	x	1000	]=	1.79E-05
Copper	4.89E-08	x		=	NA	1.71E-07	/[		x	1000	]=	NA
Fluoride	7.93E-09	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	8.99E-05	x		=	NA	3.15E-04	/[		x	1000	]=	NA
Lithium	2.79E-08	x		=	NA	9.76E-08	/[		x	1000	]=	NA
Manganese	1.45E-06	x		=	NA	5.07E-06	/[	5.00E-05	x	1000	]=	1.01E-04
Mercury	1.14E-10	x	0.00E+00	=	0.00E+00	3.99E-10	/[	3.00E-04	x	1000	]=	1.33E-09
Nickel	4.22E-08	x	2.60E-04	=	1.10E-11	1.48E-07	/[	9.00E-05	x	1000	]=	1.64E-06
Nitrate	2.69E-08	x		=	NA	9.40E-08	/[		x	1000	]=	NA
Nitrite	1.15E-08	x		=	NA	4.02E-08	/[		x	1000	]=	NA
Silver	3.07E-10	x		=	NA	1.07E-09	/[		x	1000	]=	NA
Strontium	1.36E-07	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Tin	2.39E-08	x		=	NA	8.35E-08	/[		x	1000	]=	NA
Total Uranium	2.68E-09	x		=	NA	9.40E-09	/[	4.00E-05	x	1000	]=	2.35E-07
Vanadium	2.62E-07	x		=	NA	9.16E-07	/[	1.00E-04	x	1000	]=	9.16E-06
Zinc	1.44E-07	x		=	NA	5.04E-07	/[		x	1000	]=	NA
2-Butanone	9.33E-12	x	0.00E+00	=	0.00E+00	3.26E-11	/[	5.00E+00	x	1000	]=	6.53E-15
Bis(2-ethylhexyl) phthalate	1.51E-08	x	2.40E-06	=	3.63E-14	5.30E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	2.22E-10	x	0.00E+00	=	0.00E+00	7.78E-10	/[		x	1000	]=	NA
Hexane	1.35E-10	x	0.00E+00	=	0.00E+00	4.72E-10	/[	7.00E-01	x	1000	]=	6.74E-13
Methylene chloride	7.51E-12	x	1.00E-08	=	7.51E-20	2.63E-11	/[	6.00E-01	x	1000	]=	4.38E-14
o-Xylene	4.80E-13	x	0.00E+00	=	0.00E+00	1.68E-12	/[	1.00E-01	x	1000	]=	1.68E-14
Styrene	2.45E-12	x	0.00E+00	=	0.00E+00	8.59E-12	/[	1.00E+00	x	1000	]=	8.59E-15
Toluene	3.67E-12	x	0.00E+00	=	0.00E+00	1.28E-11	/[	5.00E+00	x	1000	]=	2.57E-15
Xylenes (total)	1.74E-12	x	0.00E+00	=	0.00E+00	6.08E-12	/[	1.00E-01	x	1000	]=	6.08E-14
beta-BHC	9.47E-11	x	5.30E-04	=	5.02E-14	3.32E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	1.91E-11	x	3.10E-04	=	5.93E-15	6.70E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	7.73E-11	x	5.70E-04	=	4.41E-14	2.71E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		3.18E-09					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.51E-07	x	1.50E+00	=	2.27E-07	5.30E-07	/	3.00E-04	=	1.77E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.69E-10	x		=	NA	5.90E-10	/	2.50E-05	=	2.36E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	5.83E-07	x	1.40E-02	=	8.16E-09	2.04E-06	/	2.00E-02	=	1.02E-04
Butylbenzylphthalate	8.56E-09	x	1.90E-03	=	1.63E-11	3.00E-08	/	2.00E-01	=	1.50E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	3.65E-09	x	1.80E+00	=	6.57E-09	1.28E-08	/		=	NA
Gamma-BHC (Lindane)	2.95E-10	x	1.10E+00	=	3.24E-10	1.03E-09	/	3.00E-04	=	3.44E-06
Aroclor-1260	4.17E-09	x	2.00E+00	=	8.34E-09	1.46E-08	/		=	NA
			Pathway total =		2.50E-07			Pathway total =		1.89E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-04
Arsenic	Sum of all pathways	=	2.02E-06	Sum of all pathways	=	1.6E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.7E-04
Beryllium	Sum of all pathways	=	2.68E-12	Sum of all pathways	=	1.8E-04
Cadmium	Sum of all pathways	=	7.87E-13	Sum of all pathways	=	1.6E-04
Chromium	Sum of all pathways	=	2.83E-09	Sum of all pathways	=	3.6E-03
Cobalt	Sum of all pathways	=	2.76E-10	Sum of all pathways	=	3.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-09
Nickel	Sum of all pathways	=	1.10E-11	Sum of all pathways	=	6.8E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-09
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.75E-08	Sum of all pathways	=	3.4E-04
Butylbenzylphthalate	Sum of all pathways	=	5.48E-11	Sum of all pathways	=	5.0E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-07
Methylene chloride	Sum of all pathways	=	1.37E-12	Sum of all pathways	=	4.0E-07
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-10
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-08
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-09
beta-BHC	Sum of all pathways	=	2.21E-08	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	2.25E-09	Sum of all pathways	=	2.4E-05
Aroclor-1260	Sum of all pathways	=	2.25E-08	Sum of all pathways	=	NA

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.10E-06	All Pathways and Chemicals	=	1.29E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.40E-03	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	8.76E-08	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.72E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	3.10E-05	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	6.81E-08	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	4.71E-08	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	5.75E-06	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.49E-06	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.18E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	5.67E-07	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.93E-03	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.59E-06	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.40E-04	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	6.85E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	4.48E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	1.11E-05	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	4.45E-07	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	3.37E-07	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.24E-08	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.14E-05	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	1.87E-07	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.27E-05	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.53E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	6.85E-08	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Di-n-butylphthalate	1.95E-07	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	1.35E-10	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	2.12E-10	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	8.40E-03	=	[	7.01E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	3.07E-07	=	[	2.56E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	6.02E-06	=	[	5.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.08E-04	=	[	9.05E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	2.38E-07	=	[	1.99E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.65E-07	=	[	1.37E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	2.01E-05	=	[	1.68E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.22E-05	=	[	1.02E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.46E-05	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	1.99E-06	=	[	1.66E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	3.13E-02	=	[	2.61E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	9.07E-06	=	[	7.56E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.89E-04	=	[	4.08E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	2.40E-06	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.57E-05	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	3.89E-05	=	[	3.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	1.56E-06	=	[	1.30E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	1.18E-06	=	[	9.83E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	7.85E-08	=	[	6.55E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	4.00E-05	=	[	3.34E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	6.54E-07	=	[	5.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	7.93E-05	=	[	6.61E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	5.37E-05	=	[	4.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	2.40E-07	=	[	2.00E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Di-n-butylphthalate	6.83E-07	=	[	5.70E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	4.72E-10	=	[	3.94E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	7.41E-10	=	[	6.18E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.63E-05	=	[	9.6E-05	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	9.60E-10	=	[	3.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.88E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.40E-07	=	[	1.2E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	7.46E-10	=	[	2.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	5.16E-10	=	[	1.9E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	6.30E-08	=	[	2.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.82E-08	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.58E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	6.22E-09	=	[	2.3E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.79E-05	=	[	3.6E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	2.84E-08	=	[	1.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.53E-06	=	[	5.6E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Molybdenum	7.51E-09	=	[	2.7E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.91E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	1.22E-07	=	[	4.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	4.88E-09	=	[	1.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Selenium	3.69E-09	=	[	1.3E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	2.46E-10	=	[	9.0E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.25E-07	=	[	4.6E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.05E-09	=	[	7.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.48E-07	=	[	9.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.68E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.51E-10	=	[	2.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	2.14E-09	=	[	7.8E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Styrene	1.48E-12	=	[	5.4E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	2.32E-12	=	[	8.5E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.20E-05	=	[	9.6E-05	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.36E-09	=	[	3.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	6.59E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.19E-06	=	[	1.2E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	2.61E-09	=	[	2.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.81E-09	=	[	1.9E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	2.21E-07	=	[	2.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.34E-07	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	2.18E-08	=	[	2.3E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.43E-04	=	[	3.6E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	9.93E-08	=	[	1.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	5.36E-06	=	[	5.6E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Molybdenum	2.63E-08	=	[	2.7E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.72E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	4.26E-07	=	[	4.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	1.71E-08	=	[	1.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Selenium	1.29E-08	=	[	1.3E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	8.60E-10	=	[	9.0E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.39E-07	=	[	4.6E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	7.16E-09	=	[	7.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	8.69E-07	=	[	9.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	5.88E-07	=	[	6.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	2.63E-09	=	[	2.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Di-n-butylphthalate	7.49E-09	=	[	7.8E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Styrene	5.17E-12	=	[	5.4E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	8.12E-12	=	[	8.5E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.18E-07	=	[	5.02E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.99E-10	=	[	1.37E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.89E-08	=	[	2.00E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Di-n-butylphthalate	8.24E-08	=	[	5.70E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	7.62E-07	=	[	5.02E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	6.96E-10	=	[	1.37E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	1.01E-07	=	[	2.00E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Di-n-butylphthalate	2.88E-07	=	[	5.70E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.40E-03	x	0.00E+00	=	0.00E+00	8.40E-03	/	1.00E+00	=	8.40E-03
Antimony	8.76E-08	x	0.00E+00	=	0.00E+00	3.07E-07	/	4.00E-04	=	7.67E-04
Arsenic	1.72E-06	x	1.50E+00	=	2.58E-06	6.02E-06	/	3.00E-04	=	2.01E-02
Barium	3.10E-05	x	0.00E+00	=	0.00E+00	1.08E-04	/	2.00E-01	=	5.42E-04
Beryllium	6.81E-08	x	0.00E+00	=	0.00E+00	2.38E-07	/	2.00E-03	=	1.19E-04
Cadmium	4.71E-08	x	0.00E+00	=	0.00E+00	1.65E-07	/	1.00E-03	=	1.65E-04
Chromium	5.75E-06	x	0.00E+00	=	0.00E+00	2.01E-05	/	3.00E-03	=	6.71E-03
Cobalt	3.49E-06	x	0.00E+00	=	0.00E+00	1.22E-05	/	3.00E-04	=	4.07E-02
Copper	4.18E-06	x	0.00E+00	=	0.00E+00	1.46E-05	/	4.00E-02	=	3.65E-04
Fluoride	5.67E-07	x	0.00E+00	=	0.00E+00	1.99E-06	/	4.00E-02	=	4.97E-05
Iron	8.93E-03	x	0.00E+00	=	0.00E+00	3.13E-02	/	7.00E-01	=	4.47E-02
Lithium	2.59E-06	x	0.00E+00	=	0.00E+00	9.07E-06	/	2.00E-03	=	4.53E-03
Manganese	1.40E-04	x	0.00E+00	=	0.00E+00	4.89E-04	/	1.40E-01	=	3.49E-03
Molybdenum	6.85E-07	x	0.00E+00	=	0.00E+00	2.40E-06	/	5.00E-03	=	4.79E-04
Nickel	4.48E-06	x	0.00E+00	=	0.00E+00	1.57E-05	/	2.00E-02	=	7.84E-04
Nitrate	1.11E-05	x	0.00E+00	=	0.00E+00	3.89E-05	/	7.10E+00	=	5.48E-06
Nitrite	4.45E-07	x	0.00E+00	=	0.00E+00	1.56E-06	/	3.00E-01	=	5.19E-06
Selenium	3.37E-07	x	0.00E+00	=	0.00E+00	1.18E-06	/	5.00E-03	=	2.36E-04
Silver	2.24E-08	x	0.00E+00	=	0.00E+00	7.85E-08	/	5.00E-03	=	1.57E-05
Strontium	1.14E-05	x	0.00E+00	=	0.00E+00	4.00E-05	/	6.00E-01	=	6.67E-05
Total Uranium	1.87E-07	x	0.00E+00	=	0.00E+00	6.54E-07	/	3.00E-03	=	2.18E-04
Vanadium	2.27E-05	x	0.00E+00	=	0.00E+00	7.93E-05	/	5.00E-03	=	1.59E-02
Zinc	1.53E-05	x	0.00E+00	=	0.00E+00	5.37E-05	/	3.00E-01	=	1.79E-04
Butylbenzylphthalate	6.85E-08	x	1.90E-03	=	1.30E-10	2.40E-07	/	2.00E-01	=	1.20E-06
Di-n-butylphthalate	1.95E-07	x	0.00E+00	=	0.00E+00	6.83E-07	/	1.00E-01	=	6.83E-06
Styrene	1.35E-10	x	0.00E+00	=	0.00E+00	4.72E-10	/	2.00E-01	=	2.36E-09
Toluene	2.12E-10	x	0.00E+00	=	0.00E+00	7.41E-10	/	8.00E-02	=	9.26E-09
			Pathway total	=	2.58E-06			Pathway total	=	1.48E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	2.63E-05	x		=	NA	9.20E-05	/[	5.00E-03	x	1000	]=	1.84E-05
Antimony	9.60E-10	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	1.88E-08	x	4.30E-03	=	8.10E-11	6.59E-08	/[	1.50E-05	x	1000	]=	4.40E-06
Barium	3.40E-07	x		=	NA	1.19E-06	/[	5.00E-04	x	1000	]=	2.38E-06
Beryllium	7.46E-10	x	2.40E-03	=	1.79E-12	2.61E-09	/[	2.00E-05	x	1001	]=	1.30E-07
Cadmium	5.16E-10	x	1.80E-03	=	9.28E-13	1.81E-09	/[	1.00E-05	x	1002	]=	1.80E-07
Chromium	6.30E-08	x	8.40E-02	=	5.30E-09	2.21E-07	/[	1.00E-04	x	1003	]=	2.20E-06
Cobalt	3.82E-08	x	9.00E-03	=	3.44E-10	1.34E-07	/[	6.00E-06	x	1004	]=	2.22E-05
Copper	4.58E-08	x		=	NA	1.60E-07	/[		x	1005	]=	NA
Fluoride	6.22E-09	x		=	NA	2.18E-08	/[	1.30E-02	x	1000	]=	1.67E-09
Iron	9.79E-05	x		=	NA	3.43E-04	/[		x	1000	]=	NA
Lithium	2.84E-08	x		=	NA	9.93E-08	/[		x	1000	]=	NA
Manganese	1.53E-06	x		=	NA	5.36E-06	/[	5.00E-05	x	1000	]=	1.07E-04
Molybdenum	7.51E-09	x	0.00E+00	=	0.00E+00	2.63E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	4.91E-08	x	2.60E-04	=	1.28E-11	1.72E-07	/[	9.00E-05	x	1000	]=	1.91E-06
Nitrate	1.22E-07	x		=	NA	4.26E-07	/[		x	1000	]=	NA
Nitrite	4.88E-09	x		=	NA	1.71E-08	/[		x	1000	]=	NA
Selenium	3.69E-09	x	0.00E+00	=	0.00E+00	1.29E-08	/[	2.00E-02	x	1000	]=	6.45E-10
Silver	2.46E-10	x		=	NA	8.60E-10	/[		x	1000	]=	NA
Strontium	1.25E-07	x		=	NA	4.39E-07	/[		x	1000	]=	NA
Total Uranium	2.05E-09	x		=	NA	7.16E-09	/[	4.00E-05	x	1000	]=	1.79E-07
Vanadium	2.48E-07	x		=	NA	8.69E-07	/[	1.00E-04	x	1000	]=	8.69E-06
Zinc	1.68E-07	x		=	NA	5.88E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	7.51E-10	x	0.00E+00	=	0.00E+00	2.63E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	2.14E-09	x	0.00E+00	=	0.00E+00	7.49E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	1.48E-12	x	0.00E+00	=	0.00E+00	5.17E-12	/[	1.00E+00	x	1000	]=	5.17E-15
Toluene	2.32E-12	x	0.00E+00	=	0.00E+00	8.12E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		5.74E-09					Pathway total =		1.68E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.18E-07	x	1.50E+00	=	3.27E-07	7.62E-07	/	3.00E-04	=	2.54E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.99E-10	x		=	NA	6.96E-10	/	2.50E-05	=	2.78E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	2.89E-08	x	1.90E-03	=	5.49E-11	1.01E-07	/	2.00E-01	=	5.06E-07
Di-n-butylphthalate	8.24E-08	x		=	NA	2.88E-07	/	1.00E-01	=	2.88E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		**3.27E-07**			Pathway total =		2.57E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-04
Arsenic	Sum of all pathways	=	2.91E-06	Sum of all pathways	=	2.3E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-04
Beryllium	Sum of all pathways	=	1.79E-12	Sum of all pathways	=	1.2E-04
Cadmium	Sum of all pathways	=	9.28E-13	Sum of all pathways	=	1.9E-04
Chromium	Sum of all pathways	=	5.30E-09	Sum of all pathways	=	6.7E-03
Cobalt	Sum of all pathways	=	3.44E-10	Sum of all pathways	=	4.1E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.7E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-03
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-04
Nickel	Sum of all pathways	=	1.28E-11	Sum of all pathways	=	7.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Butylbenzylphthalate	Sum of all pathways	=	1.85E-10	Sum of all pathways	=	1.7E-06
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	9.7E-06
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-09

Total Carcinogenic Risk		
All Pathways and Chemicals	=	2.91E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.51E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.65E-03	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	7.40E-07	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.70E-06	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	8.36E-05	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	1.12E-07	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Boron	1.50E-05	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	3.87E-08	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.97E-06	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	2.83E-06	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.73E-06	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	5.24E-07	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.25E-03	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.97E-06	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.31E-04	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	5.55E-09	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	4.69E-06	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	3.16E-06	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	8.56E-07	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.14E-08	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	4.28E-05	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Tin	1.23E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.23E-07	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	1.86E-05	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.79E-05	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	7.09E-07	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.66E-08	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	9.28E-03	=	[	7.74E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	2.59E-06	=	[	2.16E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	9.46E-06	=	[	7.89E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	2.92E-04	=	[	2.44E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	3.93E-07	=	[	3.28E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Boron	5.26E-05	=	[	4.39E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.35E-07	=	[	1.13E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.39E-05	=	[	1.16E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	9.91E-06	=	[	8.27E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.65E-05	=	[	1.38E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	1.83E-06	=	[	1.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.89E-02	=	[	2.41E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.04E-05	=	[	8.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.59E-04	=	[	3.83E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	1.94E-08	=	[	1.62E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.64E-05	=	[	1.37E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	1.11E-05	=	[	9.23E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	3.00E-06	=	[	2.50E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	7.48E-08	=	[	6.24E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	1.50E-04	=	[	1.25E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Tin	4.32E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	7.80E-07	=	[	6.50E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	6.51E-05	=	[	5.43E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	6.27E-05	=	[	5.23E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	2.48E-06	=	[	2.07E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	9.33E-08	=	[	7.78E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.90E-05	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	8.11E-09	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	2.96E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	9.16E-07	=	[	3.3E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	1.23E-09	=	[	4.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Boron	1.65E-07	=	[	6.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	4.24E-10	=	[	1.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	4.35E-08	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.10E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	5.18E-08	=	[	1.9E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	5.74E-09	=	[	2.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.04E-05	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.26E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.44E-06	=	[	5.2E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	6.08E-11	=	[	2.2E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	5.14E-08	=	[	1.9E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	3.46E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	9.38E-09	=	[	3.4E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	2.34E-10	=	[	8.5E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	4.69E-07	=	[	1.7E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Tin	1.35E-08	=	[	4.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.44E-09	=	[	8.9E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.04E-07	=	[	7.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.96E-07	=	[	7.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	7.77E-09	=	[	2.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.92E-10	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.02E-04	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	2.84E-08	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	1.04E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	3.21E-06	=	[	3.3E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	4.31E-09	=	[	4.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Boron	5.77E-07	=	[	6.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.48E-09	=	[	1.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.52E-07	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.09E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.81E-07	=	[	1.9E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	2.01E-08	=	[	2.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.17E-04	=	[	3.3E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.14E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	5.03E-06	=	[	5.2E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	2.13E-10	=	[	2.2E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.80E-07	=	[	1.9E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	1.21E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	3.28E-08	=	[	3.4E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	8.20E-10	=	[	8.5E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	1.64E-06	=	[	1.7E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Tin	4.73E-08	=	[	4.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	8.54E-09	=	[	8.9E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	7.13E-07	=	[	7.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	6.87E-07	=	[	7.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Bis(2-ethylhexyl) phthalate	2.72E-08	=	[	2.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	1.02E-09	=	[	1.1E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	3.42E-07	=	[	7.89E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.63E-10	=	[	1.13E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.99E-07	=	[	2.07E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.13E-08	=	[	7.78E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									

Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	1.20E-06	=	[	7.89E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	5.72E-10	=	[	1.13E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	1.05E-06	=	[	2.07E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	3.94E-08	=	[	7.78E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.65E-03	x	0.00E+00	=	0.00E+00	9.28E-03	/	1.00E+00	=	9.28E-03
Antimony	7.40E-07	x	0.00E+00	=	0.00E+00	2.59E-06	/	4.00E-04	=	6.47E-03
Arsenic	2.70E-06	x	1.50E+00	=	4.05E-06	9.46E-06	/	3.00E-04	=	3.15E-02
Barium	8.36E-05	x	0.00E+00	=	0.00E+00	2.92E-04	/	2.00E-01	=	1.46E-03
Beryllium	1.12E-07	x	0.00E+00	=	0.00E+00	3.93E-07	/	2.00E-03	=	1.97E-04
Boron	1.50E-05	x	0.00E+00	=	0.00E+00	5.26E-05	/	2.00E-01	=	2.63E-04
Cadmium	3.87E-08	x	0.00E+00	=	0.00E+00	1.35E-07	/	1.00E-03	=	1.35E-04
Chromium	3.97E-06	x	0.00E+00	=	0.00E+00	1.39E-05	/	3.00E-03	=	4.63E-03
Cobalt	2.83E-06	x	0.00E+00	=	0.00E+00	9.91E-06	/	3.00E-04	=	3.30E-02
Copper	4.73E-06	x	0.00E+00	=	0.00E+00	1.65E-05	/	4.00E-02	=	4.14E-04
Fluoride	5.24E-07	x	0.00E+00	=	0.00E+00	1.83E-06	/	4.00E-02	=	4.58E-05
Iron	8.25E-03	x	0.00E+00	=	0.00E+00	2.89E-02	/	7.00E-01	=	4.13E-02
Lithium	2.97E-06	x	0.00E+00	=	0.00E+00	1.04E-05	/	2.00E-03	=	5.20E-03
Manganese	1.31E-04	x	0.00E+00	=	0.00E+00	4.59E-04	/	1.40E-01	=	3.28E-03
Mercury	5.55E-09	x	0.00E+00	=	0.00E+00	1.94E-08	/	0.00E+00	=	**NA**
Nickel	4.69E-06	x	0.00E+00	=	0.00E+00	1.64E-05	/	2.00E-02	=	8.21E-04
Nitrate	3.16E-06	x	0.00E+00	=	0.00E+00	1.11E-05	/	7.10E+00	=	1.56E-06
Nitrite	8.56E-07	x	0.00E+00	=	0.00E+00	3.00E-06	/	3.00E-01	=	9.99E-06
Silver	2.14E-08	x	0.00E+00	=	0.00E+00	7.48E-08	/	5.00E-03	=	1.50E-05
Strontium	4.28E-05	x	0.00E+00	=	0.00E+00	1.50E-04	/	6.00E-01	=	2.50E-04
Tin	1.23E-06	x	0.00E+00	=	0.00E+00	4.32E-06	/	6.00E-01	=	7.19E-06
Total Uranium	2.23E-07	x	0.00E+00	=	0.00E+00	7.80E-07	/	3.00E-03	=	2.60E-04
Vanadium	1.86E-05	x	0.00E+00	=	0.00E+00	6.51E-05	/	5.00E-03	=	1.30E-02
Zinc	1.79E-05	x	0.00E+00	=	0.00E+00	6.27E-05	/	3.00E-01	=	2.09E-04
Bis(2-ethylhexyl) phthalate	7.09E-07	x	1.40E-02	=	9.92E-09	2.48E-06	/	2.00E-02	=	1.24E-04
Butylbenzylphthalate	2.66E-08	x	1.90E-03	=	5.06E-11	9.33E-08	/	2.00E-01	=	4.66E-07
			Pathway total	=	4.06E-06			Pathway total	=	1.52E-01

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	2.90E-05	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	8.11E-09	x		=	NA	2.84E-08	/[		x	1000	]=	NA
Arsenic	2.96E-08	x	4.30E-03	=	1.27E-10	1.04E-07	/[	1.50E-05	x	1000	]=	6.91E-06
Barium	9.16E-07	x		=	NA	3.21E-06	/[	5.00E-04	x	1000	]=	6.41E-06
Beryllium	1.23E-09	x	2.40E-03	=	2.95E-12	4.31E-09	/[	2.00E-05	x	1000	]=	2.15E-07
Boron	1.65E-07	x	0.00E+00	=	0.00E+00	5.77E-07	/[	2.00E-02	x	1000	]=	2.88E-08
Cadmium	4.24E-10	x	1.80E-03	=	7.63E-13	1.48E-09	/[	1.00E-05	x	1000	]=	1.48E-07
Chromium	4.35E-08	x	8.40E-02	=	3.66E-09	1.52E-07	/[	1.00E-04	x	1000	]=	1.52E-06
Cobalt	3.10E-08	x	9.00E-03	=	2.79E-10	1.09E-07	/[	6.00E-06	x	1000	]=	1.81E-05
Copper	5.18E-08	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	5.74E-09	x		=	NA	2.01E-08	/[	1.30E-02	x	1000	]=	1.55E-09
Iron	9.04E-05	x		=	NA	3.17E-04	/[		x	1000	]=	NA
Lithium	3.26E-08	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	1.44E-06	x		=	NA	5.03E-06	/[	5.00E-05	x	1000	]=	1.01E-04
Mercury	6.08E-11	x	0.00E+00	=	0.00E+00	2.13E-10	/[	3.00E-04	x	1000	]=	7.09E-10
Nickel	5.14E-08	x	2.60E-04	=	1.34E-11	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	3.46E-08	x		=	NA	1.21E-07	/[		x	1000	]=	NA
Nitrite	9.38E-09	x		=	NA	3.28E-08	/[		x	1000	]=	NA
Silver	2.34E-10	x		=	NA	8.20E-10	/[		x	1000	]=	NA
Strontium	4.69E-07	x		=	NA	1.64E-06	/[		x	1000	]=	NA
Tin	1.35E-08	x		=	NA	4.73E-08	/[		x	1000	]=	NA
Total Uranium	2.44E-09	x		=	NA	8.54E-09	/[	4.00E-05	x	1000	]=	2.14E-07
Vanadium	2.04E-07	x		=	NA	7.13E-07	/[	1.00E-04	x	1000	]=	7.13E-06
Zinc	1.96E-07	x		=	NA	6.87E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	7.77E-09	x	2.40E-06	=	1.86E-14	2.72E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	2.92E-10	x	0.00E+00	=	0.00E+00	1.02E-09	/		x	1000	]=	NA
			Pathway total =		4.08E-09					Pathway total =		1.64E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.42E-07	x	1.50E+00	=	5.13E-07	1.20E-06	/	3.00E-04	=	3.99E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.63E-10	x		=	NA	5.72E-10	/	2.50E-05	=	2.29E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	2.99E-07	x	1.40E-02	=	4.19E-09	1.05E-06	/	2.00E-02	=	5.24E-05
Butylbenzylphthalate	1.13E-08	x	1.90E-03	=	2.14E-11	3.94E-08	/	2.00E-01	=	1.97E-07
			Pathway total =		5.18E-07			Pathway total =		4.07E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-03
Arsenic	Sum of all pathways	=	4.57E-06	Sum of all pathways	=	3.6E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03
Beryllium	Sum of all pathways	=	2.95E-12	Sum of all pathways	=	2.0E-04
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Cadmium	Sum of all pathways	=	7.63E-13	Sum of all pathways	=	1.6E-04
Chromium	Sum of all pathways	=	3.66E-09	Sum of all pathways	=	4.6E-03
Cobalt	Sum of all pathways	=	2.79E-10	Sum of all pathways	=	3.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-10
Nickel	Sum of all pathways	=	1.34E-11	Sum of all pathways	=	8.2E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-06
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.41E-08	Sum of all pathways	=	1.8E-04
Butylbenzylphthalate	Sum of all pathways	=	7.20E-11	Sum of all pathways	=	6.6E-07

Total Carcinogenic Risk All Pathways and Chemicals	=	4.58E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.56E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.19E-03	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	9.22E-08	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.23E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	2.86E-05	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	5.61E-08	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	3.28E-08	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.31E-06	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	2.83E-06	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.17E-06	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	4.33E-07	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	7.21E-03	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.42E-06	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.22E-04	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	5.86E-09	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	8.39E-07	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	4.50E-06	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	2.63E-06	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	1.06E-06	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	4.62E-07	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	3.22E-08	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.06E-05	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.36E-07	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.02E-05	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.30E-05	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	1.58E-08	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
1-Butanol	7.60E-09	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.30E-07	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	2.03E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Hexane	2.07E-08	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	7.76E-09	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	7.67E-03	=	[	6.40E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	3.23E-07	=	[	2.69E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	4.31E-06	=	[	3.60E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.00E-04	=	[	8.34E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	1.96E-07	=	[	1.64E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.15E-07	=	[	9.56E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.16E-05	=	[	9.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	9.90E-06	=	[	8.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.46E-05	=	[	1.22E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	1.52E-06	=	[	1.26E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.52E-02	=	[	2.11E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	8.47E-06	=	[	7.07E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.27E-04	=	[	3.56E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	2.05E-08	=	[	1.71E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	2.94E-06	=	[	2.45E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.57E-05	=	[	1.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	9.21E-06	=	[	7.68E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	3.72E-06	=	[	3.10E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	1.62E-06	=	[	1.35E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	1.13E-07	=	[	9.40E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	3.72E-05	=	[	3.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	8.24E-07	=	[	6.88E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	7.09E-05	=	[	5.91E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	4.56E-05	=	[	3.80E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	5.54E-08	=	[	4.62E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
1-Butanol	2.66E-08	=	[	2.22E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	2.21E-06	=	[	1.84E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	7.10E-08	=	[	5.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Hexane	7.25E-08	=	[	6.05E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	2.71E-08	=	[	2.27E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.40E-05	=	[	8.8E-05	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	1.01E-09	=	[	3.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.35E-08	=	[	4.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.13E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	6.15E-10	=	[	2.2E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	3.59E-10	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	3.63E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.10E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.57E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	4.74E-09	=	[	1.7E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	7.91E-05	=	[	2.9E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	2.65E-08	=	[	9.7E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.34E-06	=	[	4.9E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	6.42E-11	=	[	2.3E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Molybdenum	9.19E-09	=	[	3.4E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.93E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	2.88E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	1.16E-08	=	[	4.2E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Selenium	5.07E-09	=	[	1.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	3.53E-10	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.16E-07	=	[	4.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.58E-09	=	[	9.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.22E-07	=	[	8.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.43E-07	=	[	5.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Acetone	1.73E-10	=	[	6.3E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
1-Butanol	8.33E-11	=	[	3.0E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	6.91E-09	=	[	2.5E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.22E-10	=	[	8.1E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Hexane	2.27E-10	=	[	8.3E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
beta-BHC	8.50E-11	=	[	3.1E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.40E-05	=	[	8.8E-05	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.54E-09	=	[	3.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	4.73E-08	=	[	4.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.10E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	2.15E-09	=	[	2.2E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.26E-09	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.27E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.08E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	1.66E-08	=	[	1.7E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	2.77E-04	=	[	2.9E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	9.29E-08	=	[	9.7E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	4.67E-06	=	[	4.9E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	2.25E-10	=	[	2.3E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Molybdenum	3.22E-08	=	[	3.4E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.72E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	1.01E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	4.07E-08	=	[	4.2E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Selenium	1.77E-08	=	[	1.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	1.23E-09	=	[	1.3E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.07E-07	=	[	4.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	9.03E-09	=	[	9.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	7.77E-07	=	[	8.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	4.99E-07	=	[	5.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Acetone	6.07E-10	=	[	6.3E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
1-Butanol	2.92E-10	=	[	3.0E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Bis(2-ethylhexyl) phthalate	2.42E-08	=	[	2.5E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	7.78E-10	=	[	8.1E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Hexane	7.95E-10	=	[	8.3E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
beta-BHC	2.98E-10	=	[	3.1E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.56E-07	=	[	3.60E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.38E-10	=	[	9.56E-02	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
1-Butanol	3.21E-09	=	[	2.22E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.66E-07	=	[	1.84E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	8.56E-09	=	[	5.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	3.28E-09	=	[	2.27E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	5.46E-07	=	[	3.60E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	4.84E-10	=	[	9.56E-02	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
1-Butanol	1.12E-08	=	[	2.22E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	9.31E-07	=	[	1.84E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	3.00E-08	=	[	5.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	1.15E-08	=	[	2.27E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.19E-03	x	0.00E+00	=	0.00E+00	7.67E-03	/	1.00E+00	=	7.67E-03
Antimony	9.22E-08	x	0.00E+00	=	0.00E+00	3.23E-07	/	4.00E-04	=	8.07E-04
Arsenic	1.23E-06	x	1.50E+00	=	1.85E-06	4.31E-06	/	3.00E-04	=	1.44E-02
Barium	2.86E-05	x	0.00E+00	=	0.00E+00	1.00E-04	/	2.00E-01	=	5.00E-04
Beryllium	5.61E-08	x	0.00E+00	=	0.00E+00	1.96E-07	/	2.00E-03	=	9.82E-05
Cadmium	3.28E-08	x	0.00E+00	=	0.00E+00	1.15E-07	/	1.00E-03	=	1.15E-04
Chromium	3.31E-06	x	0.00E+00	=	0.00E+00	1.16E-05	/	3.00E-03	=	3.87E-03
Cobalt	2.83E-06	x	0.00E+00	=	0.00E+00	9.90E-06	/	3.00E-04	=	3.30E-02
Copper	4.17E-06	x	0.00E+00	=	0.00E+00	1.46E-05	/	4.00E-02	=	3.65E-04
Fluoride	4.33E-07	x	0.00E+00	=	0.00E+00	1.52E-06	/	4.00E-02	=	3.79E-05
Iron	7.21E-03	x	0.00E+00	=	0.00E+00	2.52E-02	/	7.00E-01	=	3.61E-02
Lithium	2.42E-06	x	0.00E+00	=	0.00E+00	8.47E-06	/	2.00E-03	=	4.24E-03
Manganese	1.22E-04	x	0.00E+00	=	0.00E+00	4.27E-04	/	1.40E-01	=	3.05E-03
Mercury	5.86E-09	x	0.00E+00	=	0.00E+00	2.05E-08	/	0.00E+00	=	NA
Molybdenum	8.39E-07	x	0.00E+00	=	0.00E+00	2.94E-06	/	5.00E-03	=	5.87E-04
Nickel	4.50E-06	x	0.00E+00	=	0.00E+00	1.57E-05	/	2.00E-02	=	7.87E-04
Nitrate	2.63E-06	x	0.00E+00	=	0.00E+00	9.21E-06	/	7.10E+00	=	1.30E-06
Nitrite	1.06E-06	x	0.00E+00	=	0.00E+00	3.72E-06	/	3.00E-01	=	1.24E-05
Selenium	4.62E-07	x	0.00E+00	=	0.00E+00	1.62E-06	/	5.00E-03	=	3.24E-04
Silver	3.22E-08	x	0.00E+00	=	0.00E+00	1.13E-07	/	5.00E-03	=	2.25E-05
Strontium	1.06E-05	x	0.00E+00	=	0.00E+00	3.72E-05	/	6.00E-01	=	6.19E-05
Total Uranium	2.36E-07	x	0.00E+00	=	0.00E+00	8.24E-07	/	3.00E-03	=	2.75E-04
Vanadium	2.02E-05	x	0.00E+00	=	0.00E+00	7.09E-05	/	5.00E-03	=	1.42E-02
Zinc	1.30E-05	x	0.00E+00	=	0.00E+00	4.56E-05	/	3.00E-01	=	1.52E-04
Acetone	1.58E-08	x	0.00E+00	=	0.00E+00	5.54E-08	/	9.00E-01	=	6.15E-08
1-Butanol	7.60E-09	x	0.00E+00	=	0.00E+00	2.66E-08	/	1.00E-01	=	2.66E-07
Bis(2-ethylhexyl) phthalate	6.30E-07	x	1.40E-02	=	8.82E-09	2.21E-06	/	2.00E-02	=	1.10E-04
Butylbenzylphthalate	2.03E-08	x	1.90E-03	=	3.85E-11	7.10E-08	/	2.00E-01	=	3.55E-07
Hexane	2.07E-08	x	0.00E+00	=	0.00E+00	7.25E-08	/	6.00E-02	=	1.21E-06
beta-BHC	7.76E-09	x	1.80E+00	=	1.40E-08	2.71E-08	/	0.00E+00	=	NA
			Pathway total	=	1.87E-06			Pathway total	=	1.21E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	2.40E-05	x		=	NA	8.40E-05	/[	5.00E-03	x	1000	]=	1.68E-05
Antimony	1.01E-09	x		=	NA	3.54E-09	/[		x	1000	]=	NA
Arsenic	1.35E-08	x	4.30E-03	=	5.81E-11	4.73E-08	/[	1.50E-05	x	1000	]=	3.15E-06
Barium	3.13E-07	x		=	NA	1.10E-06	/[	5.00E-04	x	1000	]=	2.19E-06
Beryllium	6.15E-10	x	2.40E-03	=	1.48E-12	2.15E-09	/[	2.00E-05	x	1000	]=	1.08E-07
Cadmium	3.59E-10	x	1.80E-03	=	6.46E-13	1.26E-09	/[	1.00E-05	x	1000	]=	1.26E-07
Chromium	3.63E-08	x	8.40E-02	=	3.05E-09	1.27E-07	/[	1.00E-04	x	1000	]=	1.27E-06
Cobalt	3.10E-08	x	9.00E-03	=	2.79E-10	1.08E-07	/[	6.00E-06	x	1000	]=	1.81E-05
Copper	4.57E-08	x		=	NA	1.60E-07	/[		x	1000	]=	NA
Fluoride	4.74E-09	x		=	NA	1.66E-08	/[	1.30E-02	x	1000	]=	1.28E-09
Iron	7.91E-05	x		=	NA	2.77E-04	/[		x	1000	]=	NA
Lithium	2.65E-08	x		=	NA	9.29E-08	/[		x	1000	]=	NA
Manganese	1.34E-06	x		=	NA	4.67E-06	/[	5.00E-05	x	1000	]=	9.35E-05
Mercury	6.42E-11	x	0.00E+00	=	0.00E+00	2.25E-10	/[	3.00E-04	x	1000	]=	7.49E-10
Molybdenum	9.19E-09	x	0.00E+00	=	0.00E+00	3.22E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	4.93E-08	x	2.60E-04	=	1.28E-11	1.72E-07	/[	9.00E-05	x	1000	]=	1.92E-06
Nitrate	2.88E-08	x		=	NA	1.01E-07	/[		x	1000	]=	NA
Nitrite	1.16E-08	x		=	NA	4.07E-08	/[		x	1000	]=	NA
Selenium	5.07E-09	x	0.00E+00	=	0.00E+00	1.77E-08	/[	2.00E-02	x	1000	]=	8.87E-10
Silver	3.53E-10	x		=	NA	1.23E-09	/[		x	1000	]=	NA
Strontium	1.16E-07	x		=	NA	4.07E-07	/[		x	1000	]=	NA
Total Uranium	2.58E-09	x		=	NA	9.03E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	2.22E-07	x		=	NA	7.77E-07	/[	1.00E-04	x	1000	]=	7.77E-06
Zinc	1.43E-07	x		=	NA	4.99E-07	/[		x	1000	]=	NA
Acetone	1.73E-10	x	0.00E+00	=	0.00E+00	6.07E-10	/[	3.10E+01	x	1000	]=	1.96E-14
1-Butanol	8.33E-11	x	0.00E+00	=	0.00E+00	2.92E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	6.91E-09	x	2.40E-06	=	1.66E-14	2.42E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	2.22E-10	x	0.00E+00	=	0.00E+00	7.78E-10	/[		x	1000	]=	NA
Hexane	2.27E-10	x	0.00E+00	=	0.00E+00	7.95E-10	/[	7.00E-01	x	1000	]=	1.14E-12
beta-BHC	8.50E-11	x	5.30E-04	=	4.51E-14	2.98E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		3.40E-09					Pathway total =		1.45E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.56E-07	x	1.50E+00	=	2.34E-07	5.46E-07	/	3.00E-04	=	1.82E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.38E-10	x		=	NA	4.84E-10	/	2.50E-05	=	1.94E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	3.21E-09	x		=	NA	1.12E-08	/	1.00E-01	=	1.12E-07
Bis(2-ethylhexyl) phthalate	2.66E-07	x	1.40E-02	=	3.72E-09	9.31E-07	/	2.00E-02	=	4.66E-05
Butylbenzylphthalate	8.56E-09	x	1.90E-03	=	1.63E-11	3.00E-08	/	2.00E-01	=	1.50E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	3.28E-09	x	1.80E+00	=	5.90E-09	1.15E-08	/		=	NA
			Pathway total =		2.44E-07			Pathway total =		1.89E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-04
Arsenic	Sum of all pathways	=	2.08E-06	Sum of all pathways	=	1.6E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-04
Beryllium	Sum of all pathways	=	1.48E-12	Sum of all pathways	=	9.8E-05
Cadmium	Sum of all pathways	=	6.46E-13	Sum of all pathways	=	1.3E-04
Chromium	Sum of all pathways	=	3.05E-09	Sum of all pathways	=	3.9E-03
Cobalt	Sum of all pathways	=	2.79E-10	Sum of all pathways	=	3.3E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-10
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-04
Nickel	Sum of all pathways	=	1.28E-11	Sum of all pathways	=	7.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-08
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.25E-08	Sum of all pathways	=	1.6E-04
Butylbenzylphthalate	Sum of all pathways	=	5.48E-11	Sum of all pathways	=	5.0E-07
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-06
beta-BHC	Sum of all pathways	=	1.99E-08	Sum of all pathways	=	**NA**

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.12E-06	All Pathways and Chemicals	=	1.23E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.44E-03	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	8.06E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	1.73E-06	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	2.79E-05	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	9.46E-08	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	4.14E-08	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	4.25E-06	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.14E-06	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.37E-06	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	9.84E-07	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.67E-03	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	2.87E-06	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.25E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	6.58E-09	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	3.80E-06	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	3.92E-06	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	1.58E-06	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	6.08E-08	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.13E-05	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Tin	4.93E-06	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	5.37E-07	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.66E-05	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	6.28E-05	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	3.36E-09	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	7.88E-07	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Di-n-butylphthalate	2.96E-07	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	4.59E-10	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	1.01E-10	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	8.84E-09	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-12200	9.18E-09	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	8.54E-03	=	[	7.13E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	2.82E-07	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	6.07E-06	=	[	5.06E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	9.77E-05	=	[	8.15E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	3.31E-07	=	[	2.76E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.45E-07	=	[	1.21E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.49E-05	=	[	1.24E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.10E-05	=	[	9.16E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.53E-05	=	[	1.28E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	3.44E-06	=	[	2.87E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	3.03E-02	=	[	2.53E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.00E-05	=	[	8.37E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.37E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	2.30E-08	=	[	1.92E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.33E-05	=	[	1.11E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	1.37E-05	=	[	1.14E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	5.52E-06	=	[	4.61E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	2.13E-07	=	[	1.77E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	3.97E-05	=	[	3.31E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Tin	1.73E-05	=	[	1.44E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	1.88E-06	=	[	1.57E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	9.32E-05	=	[	7.78E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	2.20E-04	=	[	1.83E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	1.18E-08	=	[	9.80E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	2.76E-06	=	[	2.30E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Di-n-butylphthalate	1.03E-06	=	[	8.63E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	1.61E-09	=	[	1.34E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	3.52E-10	=	[	2.94E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	3.09E-08	=	[	2.58E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-12200	3.21E-08	=	[	2.68E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	2.68E-05	=	[	9.8E-05	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	8.83E-10	=	[	3.2E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	1.90E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.06E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	1.04E-09	=	[	3.8E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	4.53E-10	=	[	1.7E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	4.66E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.44E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.79E-08	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	1.08E-08	=	[	3.9E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.50E-05	=	[	3.5E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.14E-08	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.37E-06	=	[	5.0E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	7.21E-11	=	[	2.6E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.17E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	4.29E-08	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	1.73E-08	=	[	6.3E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	6.66E-10	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.24E-07	=	[	4.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Tin	5.40E-08	=	[	2.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	5.89E-09	=	[	2.1E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.92E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	6.88E-07	=	[	2.5E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Acetone	3.68E-11	=	[	1.3E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	8.63E-09	=	[	3.2E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	3.24E-09	=	[	1.2E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Methylene chloride	5.03E-12	=	[	1.8E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	1.10E-12	=	[	4.0E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
beta-BHC	9.68E-11	=	[	3.5E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Aroclor-12200	1.01E-10	=	[	3.7E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.36E-05	=	[	9.8E-05	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.09E-09	=	[	3.2E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	6.65E-08	=	[	6.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.07E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	3.63E-09	=	[	3.8E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	1.59E-09	=	[	1.7E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.63E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.20E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.68E-07	=	[	1.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	3.77E-08	=	[	3.9E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.32E-04	=	[	3.5E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.10E-07	=	[	1.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	4.79E-06	=	[	5.0E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	2.52E-10	=	[	2.6E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.46E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	1.50E-07	=	[	1.6E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	6.05E-08	=	[	6.3E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	2.33E-09	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.35E-07	=	[	4.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Tin	1.89E-07	=	[	2.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	2.06E-08	=	[	2.1E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	1.02E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	2.41E-06	=	[	2.5E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Acetone	1.29E-10	=	[	1.3E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Bis(2-ethylhexyl) phthalate	3.02E-08	=	[	3.2E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Di-n-butylphthalate	1.13E-08	=	[	1.2E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Methylene chloride	1.76E-11	=	[	1.8E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	3.86E-12	=	[	4.0E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
beta-BHC	3.39E-10	=	[	3.5E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Aroclor-12200	3.52E-10	=	[	3.7E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.20E-07	=	[	5.06E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.75E-10	=	[	1.21E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.33E-07	=	[	2.30E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Di-n-butylphthalate	1.25E-07	=	[	8.63E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
beta-BHC	3.73E-09	=	[	2.58E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Aroclor-1260	5.43E-09	=	[	2.68E-02	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	7.69E-07	=	[	5.06E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	6.11E-10	=	[	1.21E-01	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Bis(2-ethylhexyl) phthalate	1.16E-06	=	[	2.30E+00	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Di-n-butylphthalate	4.37E-07	=	[	8.63E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
beta-BHC	1.31E-08	=	[	2.58E-02	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Aroclor-1260	1.90E-08	=	[	2.68E-02	x	1.00E-06	x	6,032	x	0.07	x	0.14	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.44E-03	x	0.00E+00	=	0.00E+00	8.54E-03	/	1.00E+00	=	8.54E-03
Antimony	8.06E-08	x	0.00E+00	=	0.00E+00	2.82E-07	/	4.00E-04	=	7.05E-04
Arsenic	1.73E-06	x	1.50E+00	=	2.60E-06	6.07E-06	/	3.00E-04	=	2.02E-02
Barium	2.79E-05	x	0.00E+00	=	0.00E+00	9.77E-05	/	2.00E-01	=	4.88E-04
Beryllium	9.46E-08	x	0.00E+00	=	0.00E+00	3.31E-07	/	2.00E-03	=	1.65E-04
Cadmium	4.14E-08	x	0.00E+00	=	0.00E+00	1.45E-07	/	1.00E-03	=	1.45E-04
Chromium	4.25E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	3.00E-03	=	4.96E-03
Cobalt	3.14E-06	x	0.00E+00	=	0.00E+00	1.10E-05	/	3.00E-04	=	3.66E-02
Copper	4.37E-06	x	0.00E+00	=	0.00E+00	1.53E-05	/	4.00E-02	=	3.83E-04
Fluoride	9.84E-07	x	0.00E+00	=	0.00E+00	3.44E-06	/	4.00E-02	=	8.61E-05
Iron	8.67E-03	x	0.00E+00	=	0.00E+00	3.03E-02	/	7.00E-01	=	4.33E-02
Lithium	2.87E-06	x	0.00E+00	=	0.00E+00	1.00E-05	/	2.00E-03	=	5.01E-03
Manganese	1.25E-04	x	0.00E+00	=	0.00E+00	4.37E-04	/	1.40E-01	=	3.12E-03
Mercury	6.58E-09	x	0.00E+00	=	0.00E+00	2.30E-08	/	0.00E+00	=	NA
Nickel	3.80E-06	x	0.00E+00	=	0.00E+00	1.33E-05	/	2.00E-02	=	6.66E-04
Nitrate	3.92E-06	x	0.00E+00	=	0.00E+00	1.37E-05	/	7.10E+00	=	1.93E-06
Nitrite	1.58E-06	x	0.00E+00	=	0.00E+00	5.52E-06	/	3.00E-01	=	1.84E-05
Silver	6.08E-08	x	0.00E+00	=	0.00E+00	2.13E-07	/	5.00E-03	=	4.25E-05
Strontium	1.13E-05	x	0.00E+00	=	0.00E+00	3.97E-05	/	6.00E-01	=	6.62E-05
Tin	4.93E-06	x	0.00E+00	=	0.00E+00	1.73E-05	/	6.00E-01	=	2.88E-05
Total Uranium	5.37E-07	x	0.00E+00	=	0.00E+00	1.88E-06	/	3.00E-03	=	6.27E-04
Vanadium	2.66E-05	x	0.00E+00	=	0.00E+00	9.32E-05	/	5.00E-03	=	1.86E-02
Zinc	6.28E-05	x	0.00E+00	=	0.00E+00	2.20E-04	/	3.00E-01	=	7.33E-04
Acetone	3.36E-09	x	0.00E+00	=	0.00E+00	1.18E-08	/	9.00E-01	=	1.31E-08
Bis(2-ethylhexyl) phthalate	7.88E-07	x	1.40E-02	=	1.10E-08	2.76E-06	/	2.00E-02	=	1.38E-04
Di-n-butylphthalate	2.96E-07	x	0.00E+00	=	0.00E+00	1.03E-06	/	1.00E-01	=	1.03E-05
Methylene chloride	4.59E-10	x	2.00E-03	=	9.18E-13	1.61E-09	/	6.00E-03	=	2.68E-07
Toluene	1.01E-10	x	0.00E+00	=	0.00E+00	3.52E-10	/	8.00E-02	=	4.40E-09
beta-BHC	8.84E-09	x	1.80E+00	=	1.59E-08	3.09E-08	/	0.00E+00	=	NA
Aroclor-1260	9.18E-09	x	2.00E+00	=	1.84E-08	3.21E-08	/	0.00E+00	=	NA
			Pathway total	=	2.65E-06			Pathway total	=	1.45E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	2.68E-05	x		=	NA	9.36E-05	/[	5.00E-03	x	1000	]=	1.87E-05
Antimony	8.83E-10	x		=	NA	3.09E-09	/[		x	1000	]=	NA
Arsenic	1.90E-08	x	4.30E-03	=	8.17E-11	6.65E-08	/[	1.50E-05	x	1000	]=	4.43E-06
Barium	3.06E-07	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.14E-06
Beryllium	1.04E-09	x	2.40E-03	=	2.49E-12	3.63E-09	/[	2.00E-05	x	1000	]=	1.81E-07
Cadmium	4.53E-10	x	1.80E-03	=	8.16E-13	1.59E-09	/[	1.00E-05	x	1000	]=	1.59E-07
Chromium	4.66E-08	x	8.40E-02	=	3.91E-09	1.63E-07	/[	1.00E-04	x	1000	]=	1.63E-06
Cobalt	3.44E-08	x	9.00E-03	=	3.09E-10	1.20E-07	/[	6.00E-06	x	1000	]=	2.00E-05
Copper	4.79E-08	x		=	NA	1.68E-07	/[		x	1000	]=	NA
Fluoride	1.08E-08	x		=	NA	3.77E-08	/[	1.30E-02	x	1000	]=	2.90E-09
Iron	9.50E-05	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	3.14E-08	x		=	NA	1.10E-07	/[		x	1000	]=	NA
Manganese	1.37E-06	x		=	NA	4.79E-06	/[	5.00E-05	x	1000	]=	9.57E-05
Mercury	7.21E-11	x	0.00E+00	=	0.00E+00	2.52E-10	/[	3.00E-04	x	1000	]=	8.41E-10
Nickel	4.17E-08	x	2.60E-04	=	1.08E-11	1.46E-07	/[	9.00E-05	x	1000	]=	1.62E-06
Nitrate	4.29E-08	x		=	NA	1.50E-07	/[		x	1000	]=	NA
Nitrite	1.73E-08	x		=	NA	6.05E-08	/[		x	1000	]=	NA
Silver	6.66E-10	x		=	NA	2.33E-09	/[		x	1000	]=	NA
Strontium	1.24E-07	x		=	NA	4.35E-07	/[		x	1000	]=	NA
Tin	5.40E-08	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Total Uranium	5.89E-09	x		=	NA	2.06E-08	/[	4.00E-05	x	1000	]=	5.15E-07
Vanadium	2.92E-07	x		=	NA	1.02E-06	/[	1.00E-04	x	1000	]=	1.02E-05
Zinc	6.88E-07	x		=	NA	2.41E-06	/[		x	1000	]=	NA
Acetone	3.68E-11	x	0.00E+00	=	0.00E+00	1.29E-10	/[	3.10E+01	x	1000	]=	4.15E-15
Bis(2-ethylhexyl) phthalate	8.63E-09	x	2.40E-06	=	2.07E-14	3.02E-08	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	3.24E-09	x	0.00E+00	=	0.00E+00	1.13E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	5.03E-12	x	1.00E-08	=	5.03E-20	1.76E-11	/[	6.00E-01	x	1000	]=	2.93E-14
Toluene	1.10E-12	x	0.00E+00	=	0.00E+00	3.86E-12	/[	5.00E+00	x	1000	]=	7.72E-16
beta-BHC	9.68E-11	x	5.30E-04	=	5.13E-14	3.39E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	1.01E-10	x	5.70E-04	=	5.73E-14	3.52E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		4.32E-09					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.20E-07	x	1.50E+00	=	3.30E-07	7.69E-07	/	3.00E-04	=	2.56E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.75E-10	x		=	NA	6.11E-10	/	2.50E-05	=	2.45E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	3.33E-07	x	1.40E-02	=	4.66E-09	1.16E-06	/	2.00E-02	=	5.82E-05
Di-n-butylphthalate	1.25E-07	x		=	NA	4.37E-07	/	1.00E-01	=	4.37E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	3.73E-09	x	1.80E+00	=	6.72E-09	1.31E-08	/		=	NA
Aroclor-1260	5.43E-09	x	2.00E+00	=	1.09E-08	1.90E-08	/		=	NA
			Pathway total =		**3.52E-07**			Pathway total =		2.65E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-04
Arsenic	Sum of all pathways	=	2.93E-06	Sum of all pathways	=	2.3E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-04
Beryllium	Sum of all pathways	=	2.49E-12	Sum of all pathways	=	1.7E-04
Cadmium	Sum of all pathways	=	8.16E-13	Sum of all pathways	=	1.7E-04
Chromium	Sum of all pathways	=	3.91E-09	Sum of all pathways	=	5.0E-03
Cobalt	Sum of all pathways	=	3.09E-10	Sum of all pathways	=	3.7E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-10
Nickel	Sum of all pathways	=	1.08E-11	Sum of all pathways	=	6.7E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-05
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.3E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-05
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.57E-08	Sum of all pathways	=	2.0E-04
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05
Methylene chloride	Sum of all pathways	=	9.18E-13	Sum of all pathways	=	2.7E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-09
beta-BHC	Sum of all pathways	=	2.26E-08	Sum of all pathways	=	**NA**
Aroclor-1260	Sum of all pathways	=	2.92E-08	Sum of all pathways	=	**NA**

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.00E-06	All Pathways and Chemicals	=	1.48E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.87E-03	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	8.39E-08	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.00E-06	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	2.71E-05	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	5.99E-08	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	1.19E-06	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.84E-06	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	3.60E-06	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	5.07E-06	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	1.21E-06	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	8.87E-03	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	3.10E-06	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.40E-04	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	4.62E-09	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	3.77E-06	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	1.36E-05	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	1.82E-06	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	2.40E-07	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Silver	2.38E-08	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.28E-05	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.26E-07	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	2.20E-05	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.66E-05	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	2.19E-09	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	3.66E-08	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
2-Hexanone	9.49E-10	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	4.79E-10	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	2.03E-10	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	1.01E-02	=	[	8.39E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	2.94E-07	=	[	2.45E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	6.99E-06	=	[	5.83E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	9.49E-05	=	[	7.92E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	2.10E-07	=	[	1.75E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	4.16E-06	=	[	3.47E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.34E-05	=	[	1.12E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.26E-05	=	[	1.05E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.77E-05	=	[	1.48E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	4.23E-06	=	[	3.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	3.10E-02	=	[	2.59E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.08E-05	=	[	9.05E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.90E-04	=	[	4.09E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	1.62E-08	=	[	1.35E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.32E-05	=	[	1.10E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	4.76E-05	=	[	3.97E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	6.36E-06	=	[	5.31E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	8.40E-07	=	[	7.01E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Silver	8.32E-08	=	[	6.94E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	4.47E-05	=	[	3.73E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	7.91E-07	=	[	6.60E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	7.70E-05	=	[	6.42E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	5.83E-05	=	[	4.86E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	7.67E-09	=	[	6.40E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	1.28E-07	=	[	1.07E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
2-Hexanone	3.32E-09	=	[	2.77E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	1.68E-09	=	[	1.40E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	7.10E-10	=	[	5.92E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	3.15E-05	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	9.19E-10	=	[	3.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	2.19E-08	=	[	8.0E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	2.97E-07	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	6.57E-10	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cadmium	1.30E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	4.20E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.94E-08	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	5.55E-08	=	[	2.0E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	1.32E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	9.72E-05	=	[	3.5E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.40E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.53E-06	=	[	5.6E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	5.07E-11	=	[	1.8E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	4.13E-08	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	1.49E-07	=	[	5.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	1.99E-08	=	[	7.3E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Selenium	2.63E-09	=	[	9.6E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Silver	2.60E-10	=	[	9.5E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.40E-07	=	[	5.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.48E-09	=	[	9.0E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	2.41E-07	=	[	8.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.82E-07	=	[	6.7E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Acetone	2.40E-11	=	[	8.8E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	4.02E-10	=	[	1.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
2-Hexanone	1.04E-11	=	[	3.8E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Methylene chloride	5.25E-12	=	[	1.9E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	2.22E-12	=	[	8.1E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.10E-04	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.22E-09	=	[	3.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	7.66E-08	=	[	8.0E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.04E-06	=	[	1.1E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	2.30E-09	=	[	2.4E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cadmium	4.56E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.47E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.38E-07	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.94E-07	=	[	2.0E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	4.64E-08	=	[	4.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.40E-04	=	[	3.5E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	5.37E-06	=	[	5.6E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	1.77E-10	=	[	1.8E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.44E-07	=	[	1.5E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	5.21E-07	=	[	5.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	6.98E-08	=	[	7.3E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Selenium	9.21E-09	=	[	9.6E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Silver	9.12E-10	=	[	9.5E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	4.90E-07	=	[	5.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	8.67E-09	=	[	9.0E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	8.43E-07	=	[	8.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	6.38E-07	=	[	6.7E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Acetone	8.41E-11	=	[	8.8E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Butylbenzylphthalate	1.41E-09	=	[	1.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
2-Hexanone	3.64E-11	=	[	3.8E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Methylene chloride	1.84E-11	=	[	1.9E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	7.78E-12	=	[	8.1E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.53E-07	=	[	5.83E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cadmium	5.02E-09	=	[	3.47E+00	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Butylbenzylphthalate	1.55E-08	=	[	1.07E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	8.85E-07	=	[	5.83E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cadmium	1.76E-08	=	[	3.47E+00	x	1.00E-06	x	6,032	x	0.07	x	0.001	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Butylbenzylphthalate	5.42E-08	=	[	1.07E-01	x	1.00E-06	x	6,032	x	0.07	x	0.1	x	1	x	350	x	20	]	/	[	80	x	7,300	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.87E-03	x	0.00E+00	=	0.00E+00	1.01E-02	/	1.00E+00	=	1.01E-02
Antimony	8.39E-08	x	0.00E+00	=	0.00E+00	2.94E-07	/	4.00E-04	=	7.34E-04
Arsenic	2.00E-06	x	1.50E+00	=	2.99E-06	6.99E-06	/	3.00E-04	=	2.33E-02
Barium	2.71E-05	x	0.00E+00	=	0.00E+00	9.49E-05	/	2.00E-01	=	4.75E-04
Beryllium	5.99E-08	x	0.00E+00	=	0.00E+00	2.10E-07	/	2.00E-03	=	1.05E-04
Cadmium	1.19E-06	x	0.00E+00	=	0.00E+00	4.16E-06	/	1.00E-03	=	4.16E-03
Chromium	3.84E-06	x	0.00E+00	=	0.00E+00	1.34E-05	/	3.00E-03	=	4.47E-03
Cobalt	3.60E-06	x	0.00E+00	=	0.00E+00	1.26E-05	/	3.00E-04	=	4.20E-02
Copper	5.07E-06	x	0.00E+00	=	0.00E+00	1.77E-05	/	4.00E-02	=	4.43E-04
Fluoride	1.21E-06	x	0.00E+00	=	0.00E+00	4.23E-06	/	4.00E-02	=	1.06E-04
Iron	8.87E-03	x	0.00E+00	=	0.00E+00	3.10E-02	/	7.00E-01	=	4.43E-02
Lithium	3.10E-06	x	0.00E+00	=	0.00E+00	1.08E-05	/	2.00E-03	=	5.42E-03
Manganese	1.40E-04	x	0.00E+00	=	0.00E+00	4.90E-04	/	1.40E-01	=	3.50E-03
Mercury	4.62E-09	x	0.00E+00	=	0.00E+00	1.62E-08	/	0.00E+00	=	NA
Nickel	3.77E-06	x	0.00E+00	=	0.00E+00	1.32E-05	/	2.00E-02	=	6.59E-04
Nitrate	1.36E-05	x	0.00E+00	=	0.00E+00	4.76E-05	/	7.10E+00	=	6.70E-06
Nitrite	1.82E-06	x	0.00E+00	=	0.00E+00	6.36E-06	/	3.00E-01	=	2.12E-05
Selenium	2.40E-07	x	0.00E+00	=	0.00E+00	8.40E-07	/	5.00E-03	=	1.68E-04
Silver	2.38E-08	x	0.00E+00	=	0.00E+00	8.32E-08	/	5.00E-03	=	1.66E-05
Strontium	1.28E-05	x	0.00E+00	=	0.00E+00	4.47E-05	/	6.00E-01	=	7.45E-05
Total Uranium	2.26E-07	x	0.00E+00	=	0.00E+00	7.91E-07	/	3.00E-03	=	2.64E-04
Vanadium	2.20E-05	x	0.00E+00	=	0.00E+00	7.70E-05	/	5.00E-03	=	1.54E-02
Zinc	1.66E-05	x	0.00E+00	=	0.00E+00	5.83E-05	/	3.00E-01	=	1.94E-04
Acetone	2.19E-09	x	0.00E+00	=	0.00E+00	7.67E-09	/	9.00E-01	=	8.52E-09
Butylbenzylphthalate	3.66E-08	x	1.90E-03	=	6.96E-11	1.28E-07	/	2.00E-01	=	6.41E-07
2-Hexanone	9.49E-10	x	0.00E+00	=	0.00E+00	3.32E-09	/	5.00E-03	=	6.64E-07
Methylene chloride	4.79E-10	x	2.00E-03	=	9.59E-13	1.68E-09	/	6.00E-03	=	2.80E-07
Toluene	2.03E-10	x	0.00E+00	=	0.00E+00	7.10E-10	/	8.00E-02	=	8.87E-09
			Pathway total	=	2.99E-06			Pathway total	=	1.56E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	3.15E-05	x		=	NA	1.10E-04	/[	5.00E-03	x	1000	]=	2.20E-05
Antimony	9.19E-10	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	2.19E-08	x	4.30E-03	=	9.41E-11	7.66E-08	/[	1.50E-05	x	1000	]=	5.11E-06
Barium	2.97E-07	x		=	NA	1.04E-06	/[	5.00E-04	x	1000	]=	2.08E-06
Beryllium	6.57E-10	x	2.40E-03	=	1.58E-12	2.30E-09	/[	2.00E-05	x	1000	]=	1.15E-07
Cadmium	1.30E-08	x	1.80E-03	=	2.34E-11	4.56E-08	/[	1.00E-05	x	1000	]=	4.56E-06
Chromium	4.20E-08	x	8.40E-02	=	3.53E-09	1.47E-07	/[	1.00E-04	x	1000	]=	1.47E-06
Cobalt	3.94E-08	x	9.00E-03	=	3.55E-10	1.38E-07	/[	6.00E-06	x	1000	]=	2.30E-05
Copper	5.55E-08	x		=	NA	1.94E-07	/[		x	1000	]=	NA
Fluoride	1.32E-08	x		=	NA	4.64E-08	/[	1.30E-02	x	1000	]=	3.57E-09
Iron	9.72E-05	x		=	NA	3.40E-04	/[		x	1000	]=	NA
Lithium	3.40E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	1.53E-06	x		=	NA	5.37E-06	/[	5.00E-05	x	1000	]=	1.07E-04
Mercury	5.07E-11	x	0.00E+00	=	0.00E+00	1.77E-10	/[	3.00E-04	x	1000	]=	5.91E-10
Nickel	4.13E-08	x	2.60E-04	=	1.07E-11	1.44E-07	/[	9.00E-05	x	1000	]=	1.61E-06
Nitrate	1.49E-07	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Nitrite	1.99E-08	x		=	NA	6.98E-08	/[		x	1000	]=	NA
Selenium	2.63E-09	x	0.00E+00	=	0.00E+00	9.21E-09	/[	2.00E-02	x	1000	]=	4.60E-10
Silver	2.60E-10	x		=	NA	9.12E-10	/[		x	1000	]=	NA
Strontium	1.40E-07	x		=	NA	4.90E-07	/[		x	1000	]=	NA
Total Uranium	2.48E-09	x		=	NA	8.67E-09	/[	4.00E-05	x	1000	]=	2.17E-07
Vanadium	2.41E-07	x		=	NA	8.43E-07	/[	1.00E-04	x	1000	]=	8.43E-06
Zinc	1.82E-07	x		=	NA	6.38E-07	/[		x	1000	]=	NA
Acetone	2.40E-11	x	0.00E+00	=	0.00E+00	8.41E-11	/[	3.10E+01	x	1000	]=	2.71E-15
Butylbenzylphthalate	4.02E-10	x	0.00E+00	=	0.00E+00	1.41E-09	/[		x	1000	]=	NA
2-Hexanone	1.04E-11	x	0.00E+00	=	0.00E+00	3.64E-11	/[	3.00E-02	x	1000	]=	1.21E-12
Methylene chloride	5.25E-12	x	1.00E-08	=	5.25E-20	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	2.22E-12	x	0.00E+00	=	0.00E+00	7.78E-12	/[	5.00E+00	x	1000	]=	1.56E-15
			Pathway total =		4.02E-09					Pathway total =		1.76E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.53E-07	x	1.50E+00	=	3.79E-07	8.85E-07	/	3.00E-04	=	2.95E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	5.02E-09	x		=	NA	1.76E-08	/	2.50E-05	=	7.02E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	1.55E-08	x	1.90E-03	=	2.94E-11	5.42E-08	/	2.00E-01	=	2.71E-07
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		3.79E-07			Pathway total =		3.65E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-02
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-04
Arsenic	Sum of all pathways	=	3.37E-06	Sum of all pathways	=	2.6E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-04
Beryllium	Sum of all pathways	=	1.58E-12	Sum of all pathways	=	1.0E-04
Cadmium	Sum of all pathways	=	2.34E-11	Sum of all pathways	=	4.9E-03
Chromium	Sum of all pathways	=	3.53E-09	Sum of all pathways	=	4.5E-03
Cobalt	Sum of all pathways	=	3.55E-10	Sum of all pathways	=	4.2E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-10
Nickel	Sum of all pathways	=	1.07E-11	Sum of all pathways	=	6.6E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	8.5E-09
Butylbenzylphthalate	Sum of all pathways	=	9.90E-11	Sum of all pathways	=	9.1E-07
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-07
Methylene chloride	Sum of all pathways	=	9.59E-13	Sum of all pathways	=	2.8E-07
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	8.9E-09

Total Carcinogenic Risk All Pathways and Chemicals	=	3.38E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.60E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.83E-03	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	9.97E-08	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	2.40E-06	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Barium	3.32E-05	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	8.05E-08	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Boron	2.20E-06	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	3.42E-06	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	2.99E-06	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Copper	4.52E-06	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	6.92E-07	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Iron	7.91E-03	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	3.16E-06	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	1.25E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	7.05E-09	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	8.66E-07	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	3.36E-06	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	2.91E-06	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	7.50E-07	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	6.85E-07	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	1.70E-05	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	2.11E-07	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	1.78E-05	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	1.55E-05	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	2.12E-09	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Benzene	1.12E-10	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	1.29E-10	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	2.53E-10	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	9.91E-03	=	[	8.27E+03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	3.49E-07	=	[	2.91E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	8.39E-06	=	[	7.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Barium	1.16E-04	=	[	9.69E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	2.82E-07	=	[	2.35E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Boron	7.70E-06	=	[	6.42E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	1.20E-05	=	[	1.00E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	1.05E-05	=	[	8.73E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Copper	1.58E-05	=	[	1.32E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	2.42E-06	=	[	2.02E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Iron	2.77E-02	=	[	2.31E+04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	1.11E-05	=	[	9.24E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	4.36E-04	=	[	3.64E+02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	2.47E-08	=	[	2.06E-02	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	3.03E-06	=	[	2.53E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	1.17E-05	=	[	9.80E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	1.02E-05	=	[	8.51E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	2.63E-06	=	[	2.19E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	2.40E-06	=	[	2.00E+00	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	5.95E-05	=	[	4.96E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	7.40E-07	=	[	6.18E-01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	6.22E-05	=	[	5.19E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	5.43E-05	=	[	4.53E+01	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	7.41E-09	=	[	6.18E-03	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Benzene	3.93E-10	=	[	3.28E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	4.52E-10	=	[	3.77E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	8.85E-10	=	[	7.38E-04	x	100	x	1	x	1.00E-06	x	350	x	20	]	/	[	80	x	7,300	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	3.10E-05	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Antimony	1.09E-09	=	[	4.0E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Arsenic	2.63E-08	=	[	9.6E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Barium	3.64E-07	=	[	1.3E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Beryllium	8.82E-10	=	[	3.2E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Boron	2.41E-08	=	[	8.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Chromium	3.75E-08	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Cobalt	3.28E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Copper	4.95E-08	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Fluoride	7.58E-09	=	[	2.8E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Iron	8.67E-05	=	[	3.2E-04	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Lithium	3.47E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Manganese	1.37E-06	=	[	5.0E-06	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Mercury	7.73E-11	=	[	2.8E-10	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Molybdenum	9.50E-09	=	[	3.5E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nickel	3.68E-08	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrate	3.19E-08	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Nitrite	8.22E-09	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Selenium	7.51E-09	=	[	2.7E-08	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Strontium	1.86E-07	=	[	6.8E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Total Uranium	2.32E-09	=	[	8.5E-09	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Vanadium	1.95E-07	=	[	7.1E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Zinc	1.70E-07	=	[	6.2E-07	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Acetone	2.32E-11	=	[	8.5E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Benzene	1.23E-12	=	[	4.5E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Styrene	1.41E-12	=	[	5.2E-12	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]
Toluene	2.77E-12	=	[	1.0E-11	x	350	x	24.0	x	20	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.09E-04	=	[	1.1E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Antimony	3.82E-09	=	[	4.0E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Arsenic	9.19E-08	=	[	9.6E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Barium	1.27E-06	=	[	1.3E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Beryllium	3.09E-09	=	[	3.2E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Boron	8.43E-08	=	[	8.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Chromium	1.31E-07	=	[	1.4E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Cobalt	1.15E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Copper	1.73E-07	=	[	1.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Fluoride	2.65E-08	=	[	2.8E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Iron	3.03E-04	=	[	3.2E-04	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Lithium	1.21E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Manganese	4.78E-06	=	[	5.0E-06	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Mercury	2.71E-10	=	[	2.8E-10	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Molybdenum	3.32E-08	=	[	3.5E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nickel	1.29E-07	=	[	1.3E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrate	1.12E-07	=	[	1.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Nitrite	2.88E-08	=	[	3.0E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Selenium	2.63E-08	=	[	2.7E-08	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Strontium	6.52E-07	=	[	6.8E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Total Uranium	8.11E-09	=	[	8.5E-09	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Vanadium	6.82E-07	=	[	7.1E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Zinc	5.95E-07	=	[	6.2E-07	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Acetone	8.12E-11	=	[	8.5E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Benzene	4.31E-12	=	[	4.5E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Styrene	4.95E-12	=	[	5.2E-12	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]
Toluene	9.69E-12	=	[	1.0E-11	x	350	x	24.0	x	20	]	/	[(	7,300	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Arsenic	3.04E-07	=	[	7.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Arsenic	1.06E-06	=	[	7.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0.03	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	6,032	x	0.07	x		x	1	x	350	x	20	]	/	[	80	x	7,300	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	6,032	x	0.07	x	0	x	1	x	350	x	20	]	/	[	80	x	7,300	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.83E-03	x	0.00E+00	=	0.00E+00	9.91E-03	/	1.00E+00	=	9.91E-03
Antimony	9.97E-08	x	0.00E+00	=	0.00E+00	3.49E-07	/	4.00E-04	=	8.72E-04
Arsenic	2.40E-06	x	1.50E+00	=	3.60E-06	8.39E-06	/	3.00E-04	=	2.80E-02
Barium	3.32E-05	x	0.00E+00	=	0.00E+00	1.16E-04	/	2.00E-01	=	5.81E-04
Beryllium	8.05E-08	x	0.00E+00	=	0.00E+00	2.82E-07	/	2.00E-03	=	1.41E-04
Boron	2.20E-06	x	0.00E+00	=	0.00E+00	7.70E-06	/	2.00E-01	=	3.85E-05
Chromium	3.42E-06	x	0.00E+00	=	0.00E+00	1.20E-05	/	3.00E-03	=	4.00E-03
Cobalt	2.99E-06	x	0.00E+00	=	0.00E+00	1.05E-05	/	3.00E-04	=	3.49E-02
Copper	4.52E-06	x	0.00E+00	=	0.00E+00	1.58E-05	/	4.00E-02	=	3.96E-04
Fluoride	6.92E-07	x	0.00E+00	=	0.00E+00	2.42E-06	/	4.00E-02	=	6.05E-05
Iron	7.91E-03	x	0.00E+00	=	0.00E+00	2.77E-02	/	7.00E-01	=	3.96E-02
Lithium	3.16E-06	x	0.00E+00	=	0.00E+00	1.11E-05	/	2.00E-03	=	5.54E-03
Manganese	1.25E-04	x	0.00E+00	=	0.00E+00	4.36E-04	/	1.40E-01	=	3.12E-03
Mercury	7.05E-09	x	0.00E+00	=	0.00E+00	2.47E-08	/	0.00E+00	=	NA
Molybdenum	8.66E-07	x	0.00E+00	=	0.00E+00	3.03E-06	/	5.00E-03	=	6.07E-04
Nickel	3.36E-06	x	0.00E+00	=	0.00E+00	1.17E-05	/	2.00E-02	=	5.87E-04
Nitrate	2.91E-06	x	0.00E+00	=	0.00E+00	1.02E-05	/	7.10E+00	=	1.44E-06
Nitrite	7.50E-07	x	0.00E+00	=	0.00E+00	2.63E-06	/	3.00E-01	=	8.75E-06
Selenium	6.85E-07	x	0.00E+00	=	0.00E+00	2.40E-06	/	5.00E-03	=	4.79E-04
Strontium	1.70E-05	x	0.00E+00	=	0.00E+00	5.95E-05	/	6.00E-01	=	9.91E-05
Total Uranium	2.11E-07	x	0.00E+00	=	0.00E+00	7.40E-07	/	3.00E-03	=	2.47E-04
Vanadium	1.78E-05	x	0.00E+00	=	0.00E+00	6.22E-05	/	5.00E-03	=	1.24E-02
Zinc	1.55E-05	x	0.00E+00	=	0.00E+00	5.43E-05	/	3.00E-01	=	1.81E-04
Acetone	2.12E-09	x	0.00E+00	=	0.00E+00	7.41E-09	/	9.00E-01	=	8.23E-09
Benzene	1.12E-10	x	5.50E-02	=	6.18E-12	3.93E-10	/	4.00E-03	=	9.83E-08
Styrene	1.29E-10	x	0.00E+00	=	0.00E+00	4.52E-10	/	2.00E-01	=	2.26E-09
Toluene	2.53E-10	x	0.00E+00	=	0.00E+00	8.85E-10	/	8.00E-02	=	1.11E-08
			Pathway total	=	3.60E-06			Pathway total	=	1.42E-01

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	3.10E-05	x		=	NA	1.09E-04	/[	5.00E-03	x	1000	]=	2.17E-05
Antimony	1.09E-09	x		=	NA	3.82E-09	/[		x	1000	]=	NA
Arsenic	2.63E-08	x	4.30E-03	=	1.13E-10	9.19E-08	/[	1.50E-05	x	1000	]=	6.13E-06
Barium	3.64E-07	x		=	NA	1.27E-06	/[	5.00E-04	x	1000	]=	2.55E-06
Beryllium	8.82E-10	x	2.40E-03	=	2.12E-12	3.09E-09	/[	2.00E-05	x	1000	]=	1.54E-07
Boron	2.41E-08	x	0.00E+00	=	0.00E+00	8.43E-08	/[	2.00E-02	x	1000	]=	4.22E-09
Chromium	3.75E-08	x	8.40E-02	=	3.15E-09	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	3.28E-08	x	9.00E-03	=	2.95E-10	1.15E-07	/[	6.00E-06	x	1000	]=	1.91E-05
Copper	4.95E-08	x		=	NA	1.73E-07	/[		x	1000	]=	NA
Fluoride	7.58E-09	x		=	NA	2.65E-08	/[	1.30E-02	x	1000	]=	2.04E-09
Iron	8.67E-05	x		=	NA	3.03E-04	/[		x	1000	]=	NA
Lithium	3.47E-08	x		=	NA	1.21E-07	/[		x	1000	]=	NA
Manganese	1.37E-06	x		=	NA	4.78E-06	/[	5.00E-05	x	1000	]=	9.56E-05
Mercury	7.73E-11	x	0.00E+00	=	0.00E+00	2.71E-10	/[	3.00E-04	x	1000	]=	9.02E-10
Molybdenum	9.50E-09	x	0.00E+00	=	0.00E+00	3.32E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	3.68E-08	x	2.60E-04	=	9.56E-12	1.29E-07	/[	9.00E-05	x	1000	]=	1.43E-06
Nitrate	3.19E-08	x		=	NA	1.12E-07	/[		x	1000	]=	NA
Nitrite	8.22E-09	x		=	NA	2.88E-08	/[		x	1000	]=	NA
Selenium	7.51E-09	x	0.00E+00	=	0.00E+00	2.63E-08	/[	2.00E-02	x	1000	]=	1.31E-09
Strontium	1.86E-07	x		=	NA	6.52E-07	/[		x	1000	]=	NA
Total Uranium	2.32E-09	x		=	NA	8.11E-09	/[	4.00E-05	x	1000	]=	2.03E-07
Vanadium	1.95E-07	x		=	NA	6.82E-07	/[	1.00E-04	x	1000	]=	6.82E-06
Zinc	1.70E-07	x		=	NA	5.95E-07	/[		x	1000	]=	NA
Acetone	2.32E-11	x	0.00E+00	=	0.00E+00	8.12E-11	/[	3.10E+01	x	1000	]=	2.62E-15
Benzene	1.23E-12	x	7.80E-06	=	9.60E-18	4.31E-12	/[	3.00E-02	x	1000	]=	1.44E-13
Styrene	1.41E-12	x	0.00E+00	=	0.00E+00	4.95E-12	/[	1.00E+00	x	1000	]=	4.95E-15
Toluene	2.77E-12	x	0.00E+00	=	0.00E+00	9.69E-12	/[	5.00E+00	x	1000	]=	1.94E-15
			Pathway total =		3.57E-09					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.04E-07	x	1.50E+00	=	4.55E-07	1.06E-06	/	3.00E-04	=	3.54E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		4.55E-07			Pathway total =		3.54E-03

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	9.9E-03
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-04
Arsenic	Sum of all pathways	=	4.05E-06	Sum of all pathways	=	3.2E-02
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-04
Beryllium	Sum of all pathways	=	2.12E-12	Sum of all pathways	=	1.4E-04
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-05
Chromium	Sum of all pathways	=	3.15E-09	Sum of all pathways	=	4.0E-03
Cobalt	Sum of all pathways	=	2.95E-10	Sum of all pathways	=	3.5E-02
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-04
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-05
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-02
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-03
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-10
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-04
Nickel	Sum of all pathways	=	9.56E-12	Sum of all pathways	=	5.9E-04
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-06
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-06
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-04
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	9.9E-05
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-09
Benzene	Sum of all pathways	=	6.18E-12	Sum of all pathways	=	9.8E-08
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-09
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	4.05E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	1.45E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Adult Residential Receptor

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	2E-06	5E-09	3E-06	2E-06	3E-06	4E-06	2E-06	3E-06	3E-06	4E-06
Inhalation	3E-09	5E-09	6E-09	3E-09	6E-09	4E-09	3E-09	4E-09	4E-09	4E-09
Dermal Contact	2E-07	1E-06	3E-07	3E-07	3E-07	5E-07	2E-07	4E-07	4E-07	5E-07
ELCR	2E-06	**1E-05**	3E-06	2E-06	3E-06	5E-06	2E-06	3E-06	3E-06	4E-06
Major Risk Contributors	None									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
Inhalation	1.E-04	2.E-04	2.E-04	2.E-04	2.E-04	2.E-04	1.E-04	2.E-04	2.E-04	2.E-04
Dermal Contact	2E-03	1E-02	3E-03	2E-03	3E-03	4E-03	2E-03	3E-03	4E-03	4E-03
HI	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1
Major Hazard Contributors	None									

Appendix C

Attachment C-8: Results of Nonradiological Risk Assessment under Residential Child Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	8.27E-03	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.91E-07	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	4.11E-06	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	9.32E-05	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.06E-07	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.05E-05	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	9.97E-06	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.40E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	2.44E-06	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.64E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	9.13E-06	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	3.88E-04	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.19E-05	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	9.93E-06	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	1.01E-06	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	5.29E-08	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	4.14E-05	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Tin	1.27E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	6.33E-07	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	6.57E-05	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	5.00E-05	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Diethylphthalate	3.73E-07	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1254	8.26E-09	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	9.65E-02	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.39E-06	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	4.80E-05	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.09E-03	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.24E-06	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.22E-04	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.16E-04	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.63E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	2.84E-05	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.08E-01	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.07E-04	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.53E-03	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.39E-04	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	1.16E-04	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	1.18E-05	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	6.17E-07	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.83E-04	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Tin	1.48E-04	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	7.38E-06	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	7.67E-04	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	5.83E-04	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Diethylphthalate	4.35E-06	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1254	9.64E-08	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m³			ug/m³		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.50E-06	=	[	1.0E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.99E-10	=	[	3.6E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.22E-09	=	[	5.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.57E-08	=	[	1.2E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.09E-10	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.07E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.02E-08	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.44E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.51E-09	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.71E-05	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.38E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	3.99E-07	=	[	4.8E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.22E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.02E-08	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.04E-09	=	[	1.3E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	5.43E-11	=	[	6.6E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.25E-08	=	[	5.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.31E-08	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.50E-10	=	[	7.9E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.75E-08	=	[	8.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.13E-08	=	[	6.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Diethylphthalate	3.83E-10	=	[	4.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1254	8.49E-12	=	[	1.0E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.92E-05	=	[	1.0E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.49E-09	=	[	3.6E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.93E-08	=	[	5.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.12E-06	=	[	1.2E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.27E-09	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.25E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.68E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.92E-08	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.16E-04	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.09E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.65E-06	=	[	4.8E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.42E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.22E-08	=	[	1.3E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	6.34E-10	=	[	6.6E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.96E-07	=	[	5.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.52E-07	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.58E-09	=	[	7.9E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.88E-07	=	[	8.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.99E-07	=	[	6.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Diethylphthalate	4.47E-09	=	[	4.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1254	9.90E-11	=	[	1.0E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	3.32E-07	=	[	3.75E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	2.85E-10	=	[	9.67E-02	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Diethylphthalate	1.00E-07	=	[	3.40E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1254	3.11E-09	=	[	7.54E-03	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	3.87E-06	=	[	3.75E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	3.33E-09	=	[	9.67E-02	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Diethylphthalate	1.17E-06	=	[	3.40E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1254	3.63E-08	=	[	7.54E-03	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	8.27E-03	x	0.00E+00	=	0.00E+00	9.65E-02	/	1.00E+00	=	9.65E-02
Antimony	2.91E-07	x	0.00E+00	=	0.00E+00	3.39E-06	/	4.00E-04	=	8.48E-03
Arsenic	4.11E-06	x	1.50E+00	=	6.17E-06	4.80E-05	/	3.00E-04	=	**1.60E-01**
Barium	9.32E-05	x	0.00E+00	=	0.00E+00	1.09E-03	/	2.00E-01	=	5.43E-03
Cadmium	1.06E-07	x	0.00E+00	=	0.00E+00	1.24E-06	/	1.00E-03	=	1.24E-03
Chromium	1.05E-05	x	0.00E+00	=	0.00E+00	1.22E-04	/	3.00E-03	=	4.06E-02
Cobalt	9.97E-06	x	0.00E+00	=	0.00E+00	1.16E-04	/	3.00E-04	=	**3.88E-01**
Copper	1.40E-05	x	0.00E+00	=	0.00E+00	1.63E-04	/	4.00E-02	=	4.08E-03
Fluoride	2.44E-06	x	0.00E+00	=	0.00E+00	2.84E-05	/	4.00E-02	=	7.11E-04
Iron	2.64E-02	x	0.00E+00	=	0.00E+00	3.08E-01	/	7.00E-01	=	**4.40E-01**
Lithium	9.13E-06	x	0.00E+00	=	0.00E+00	1.07E-04	/	2.00E-03	=	5.33E-02
Manganese	3.88E-04	x	0.00E+00	=	0.00E+00	4.53E-03	/	1.40E-01	=	3.23E-02
Nickel	1.19E-05	x	0.00E+00	=	0.00E+00	1.39E-04	/	2.00E-02	=	6.93E-03
Nitrate	9.93E-06	x	0.00E+00	=	0.00E+00	1.16E-04	/	7.10E+00	=	1.63E-05
Nitrite	1.01E-06	x	0.00E+00	=	0.00E+00	1.18E-05	/	3.00E-01	=	3.94E-05
Silver	5.29E-08	x	0.00E+00	=	0.00E+00	6.17E-07	/	5.00E-03	=	1.23E-04
Strontium	4.14E-05	x	0.00E+00	=	0.00E+00	4.83E-04	/	6.00E-01	=	8.04E-04
Tin	1.27E-05	x	0.00E+00	=	0.00E+00	1.48E-04	/	6.00E-01	=	2.47E-04
Total Uranium	6.33E-07	x	0.00E+00	=	0.00E+00	7.38E-06	/	3.00E-03	=	2.46E-03
Vanadium	6.57E-05	x	0.00E+00	=	0.00E+00	7.67E-04	/	5.00E-03	=	**1.53E-01**
Zinc	5.00E-05	x	0.00E+00	=	0.00E+00	5.83E-04	/	3.00E-01	=	1.94E-03
Diethylphthalate	3.73E-07	x	0.00E+00	=	0.00E+00	4.35E-06	/	8.00E-01	=	5.43E-06
Aroclor-1254	8.26E-09	x	2.00E+00	=	1.65E-08	9.64E-08	/	2.00E-05	=	4.82E-03
			Pathway total	=	6.18E-06			Pathway total	=	1.40E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.50E-06	x		=	NA	9.92E-05	/[	5.00E-03	x	1000	]=	1.98E-05
Antimony	2.99E-10	x		=	NA	3.49E-09	/[		x	1000	]=	NA
Arsenic	4.22E-09	x	4.30E-03	=	1.82E-11	4.93E-08	/[	1.50E-05	x	1000	]=	3.28E-06
Barium	9.57E-08	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Cadmium	1.09E-10	x	1.80E-03	=	1.96E-13	1.27E-09	/[	1.00E-05	x	1000	]=	1.27E-07
Chromium	1.07E-08	x	8.40E-02	=	9.02E-10	1.25E-07	/[	1.00E-04	x	1000	]=	1.25E-06
Cobalt	1.02E-08	x	9.00E-03	=	9.22E-11	1.19E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	1.44E-08	x		=	NA	1.68E-07	/[		x	1000	]=	NA
Fluoride	2.51E-09	x		=	NA	2.92E-08	/[	1.30E-02	x	1000	]=	2.25E-09
Iron	2.71E-05	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	9.38E-09	x		=	NA	1.09E-07	/[		x	1000	]=	NA
Manganese	3.99E-07	x		=	NA	4.65E-06	/[	5.00E-05	x	1000	]=	9.30E-05
Nickel	1.22E-08	x	2.60E-04	=	3.17E-12	1.42E-07	/[	9.00E-05	x	1000	]=	1.58E-06
Nitrate	1.02E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Nitrite	1.04E-09	x		=	NA	1.22E-08	/[		x	1000	]=	NA
Silver	5.43E-11	x		=	NA	6.34E-10	/[		x	1000	]=	NA
Strontium	4.25E-08	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	1.31E-08	x		=	NA	1.52E-07	/[		x	1000	]=	NA
Total Uranium	6.50E-10	x		=	NA	7.58E-09	/[	4.00E-05	x	1000	]=	1.90E-07
Vanadium	6.75E-08	x		=	NA	7.88E-07	/[	1.00E-04	x	1000	]=	7.88E-06
Zinc	5.13E-08	x		=	NA	5.99E-07	/[		x	1000	]=	NA
Diethylphthalate	3.83E-10	x		=	NA	4.47E-09	/[		x	1000	]=	NA
Aroclor-1254	8.49E-12	x	5.70E-04	=	4.84E-15	9.90E-11	/[		x	1000	]=	NA
			Pathway total =		1.02E-09					Pathway total =		1.49E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.32E-07	x	1.50E+00	=	4.98E-07	3.87E-06	/	3.00E-04	=	1.29E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	2.85E-10	x		=	NA	3.33E-09	/	2.50E-05	=	1.33E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	1.00E-07	x		=	NA	1.17E-06	/	8.00E-01	=	1.46E-06
Aroclor-1254	3.11E-09	x	2.00E+00	=	6.22E-09	3.63E-08	/	2.00E-05	=	1.81E-03
			Pathway total =		**5.04E-07**			Pathway total =		1.48E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1E-01**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8E-03	1%
Arsenic	Sum of all pathways	=	6.66E-06	Sum of all pathways	=	**2E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5E-03	0%
Cadmium	Sum of all pathways	=	1.96E-13	Sum of all pathways	=	1E-03	0%
Chromium	Sum of all pathways	=	9.02E-10	Sum of all pathways	=	**4E-02**	3%
Cobalt	Sum of all pathways	=	9.22E-11	Sum of all pathways	=	**4E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	7E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4E-01**	31%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5E-02**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3E-02**	2%
Nickel	Sum of all pathways	=	3.17E-12	Sum of all pathways	=	7E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	4E-05	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	8E-04	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**2E-01**	11%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2E-03	0%
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	7E-06	0%
Aroclor-1254	Sum of all pathways	=	2.27E-08	Sum of all pathways	=	7E-03	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**6.69E-06**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.42E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.04E-02	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	7.90E-07	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	2.32E-05	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	1.08E-04	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	4.42E-07	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.64E-07	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.40E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	1.21E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.98E-05	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	2.51E-06	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	3.13E-02	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	1.33E-05	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	4.92E-04	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	5.55E-09	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.42E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	1.91E-05	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	2.31E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	8.77E-08	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	4.90E-05	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	9.27E-07	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	8.60E-05	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	5.60E-05	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	8.84E-08	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.22E-01	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	9.22E-06	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	2.71E-04	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.26E-03	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	5.15E-06	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.92E-06	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.64E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.41E-04	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	2.31E-04	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	2.93E-05	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.66E-01	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.55E-04	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	5.74E-03	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	6.47E-08	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.66E-04	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	2.22E-04	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	2.70E-05	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	1.02E-06	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	5.72E-04	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.08E-05	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	1.00E-03	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	6.53E-04	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	1.03E-06	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.07E-05	=	[	1.3E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	8.12E-10	=	[	9.9E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	2.39E-08	=	[	2.9E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.11E-07	=	[	1.4E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	4.54E-10	=	[	5.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.69E-10	=	[	2.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.44E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.24E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	2.04E-08	=	[	2.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.58E-09	=	[	3.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.22E-05	=	[	3.9E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.36E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.06E-07	=	[	6.2E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	5.70E-12	=	[	6.9E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.46E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.96E-08	=	[	2.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.38E-09	=	[	2.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.01E-11	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.03E-08	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.52E-10	=	[	1.2E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	8.84E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.75E-08	=	[	7.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.09E-11	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.25E-04	=	[	1.3E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	9.47E-09	=	[	9.9E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	2.78E-07	=	[	2.9E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.30E-06	=	[	1.4E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	5.29E-09	=	[	5.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.97E-09	=	[	2.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.68E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.44E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.38E-07	=	[	2.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.01E-08	=	[	3.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.76E-04	=	[	3.9E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.59E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.90E-06	=	[	6.2E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	6.65E-11	=	[	6.9E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.71E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	2.29E-07	=	[	2.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	2.77E-08	=	[	2.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.05E-09	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	5.87E-07	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.11E-08	=	[	1.2E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.03E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.71E-07	=	[	7.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.06E-09	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	1.87E-06	=	[	2.12E+01	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	4.42E-10	=	[	1.50E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.38E-08	=	[	8.07E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	2.19E-05	=	[	2.12E+01	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	5.16E-09	=	[	1.50E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.78E-07	=	[	8.07E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.04E-02	x	0.00E+00	=	0.00E+00	1.22E-01	/	1.00E+00	=	**1.22E-01**
Antimony	7.90E-07	x	0.00E+00	=	0.00E+00	9.22E-06	/	4.00E-04	=	2.30E-02
Arsenic	2.32E-05	x	1.50E+00	=	3.48E-05	2.71E-04	/	3.00E-04	=	**9.04E-01**
Barium	1.08E-04	x	0.00E+00	=	0.00E+00	1.26E-03	/	2.00E-01	=	6.32E-03
Beryllium	4.42E-07	x	0.00E+00	=	0.00E+00	5.15E-06	/	2.00E-03	=	2.58E-03
Cadmium	1.64E-07	x	0.00E+00	=	0.00E+00	1.92E-06	/	1.00E-03	=	1.92E-03
Chromium	1.40E-05	x	0.00E+00	=	0.00E+00	1.64E-04	/	3.00E-03	=	5.46E-02
Cobalt	1.21E-05	x	0.00E+00	=	0.00E+00	1.41E-04	/	3.00E-04	=	**4.69E-01**
Copper	1.98E-05	x	0.00E+00	=	0.00E+00	2.31E-04	/	4.00E-02	=	5.79E-03
Fluoride	2.51E-06	x	0.00E+00	=	0.00E+00	2.93E-05	/	4.00E-02	=	7.32E-04
Iron	3.13E-02	x	0.00E+00	=	0.00E+00	3.66E-01	/	7.00E-01	=	**5.22E-01**
Lithium	1.33E-05	x	0.00E+00	=	0.00E+00	1.55E-04	/	2.00E-03	=	7.74E-02
Manganese	4.92E-04	x	0.00E+00	=	0.00E+00	5.74E-03	/	1.40E-01	=	4.10E-02
Mercury	5.55E-09	x	0.00E+00	=	0.00E+00	6.47E-08	/	0.00E+00	=	**NA**
Nickel	1.42E-05	x	0.00E+00	=	0.00E+00	1.66E-04	/	2.00E-02	=	8.31E-03
Nitrate	1.91E-05	x	0.00E+00	=	0.00E+00	2.22E-04	/	7.10E+00	=	3.13E-05
Nitrite	2.31E-06	x	0.00E+00	=	0.00E+00	2.70E-05	/	3.00E-01	=	8.99E-05
Silver	8.77E-08	x	0.00E+00	=	0.00E+00	1.02E-06	/	5.00E-03	=	2.05E-04
Strontium	4.90E-05	x	0.00E+00	=	0.00E+00	5.72E-04	/	6.00E-01	=	9.53E-04
Total Uranium	9.27E-07	x	0.00E+00	=	0.00E+00	1.08E-05	/	3.00E-03	=	3.60E-03
Vanadium	8.60E-05	x	0.00E+00	=	0.00E+00	1.00E-03	/	5.00E-03	=	**2.01E-01**
Zinc	5.60E-05	x	0.00E+00		0.00E+00	6.53E-04	/	3.00E-01	=	2.18E-03
Butylbenzylphthalate	8.84E-08	x	1.90E-03	=	1.68E-10	1.03E-06	/	2.00E-01	=	5.16E-06
			Pathway total	=	3.48E-05			Pathway total	=	**2.45E+00**

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.07E-05	x		=	NA	1.25E-04	/[	5.00E-03	x	1000	]=	2.50E-05
Antimony	8.12E-10	x		=	NA	9.47E-09	/[		x	1000	]=	NA
Arsenic	2.39E-08	x	4.30E-03	=	1.03E-10	2.78E-07	/[	1.50E-05	x	1000	]=	1.86E-05
Barium	1.11E-07	x		=	NA	1.30E-06	/[	5.00E-04	x	1000	]=	2.60E-06
Beryllium	4.54E-10	x	2.40E-03	=	1.09E-12	5.29E-09	/[	2.00E-05	x	1000	]=	2.65E-07
Cadmium	1.69E-10	x	1.80E-03	=	3.04E-13	1.97E-09	/[	1.00E-05	x	1000	]=	1.97E-07
Chromium	1.44E-08	x	8.40E-02	=	1.21E-09	1.68E-07	/[	1.00E-04	x	1000	]=	1.68E-06
Cobalt	1.24E-08	x	9.00E-03	=	1.11E-10	1.44E-07	/[	6.00E-06	x	1000	]=	2.41E-05
Copper	2.04E-08	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Fluoride	2.58E-09	x		=	NA	3.01E-08	/[	1.30E-02	x	1000	]=	2.31E-09
Iron	3.22E-05	x		=	NA	3.76E-04	/[		x	1000	]=	NA
Lithium	1.36E-08	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Manganese	5.06E-07	x		=	NA	5.90E-06	/[	5.00E-05	x	1000	]=	1.18E-04
Mercury	5.70E-12	x	0.00E+00	=	0.00E+00	6.65E-11	/[	3.00E-04	x	1000	]=	2.22E-10
Nickel	1.46E-08	x	2.60E-04	=	3.81E-12	1.71E-07	/[	9.00E-05	x	1000	]=	1.90E-06
Nitrate	1.96E-08	x		=	NA	2.29E-07	/[		x	1000	]=	NA
Nitrite	2.38E-09	x		=	NA	2.77E-08	/[		x	1000	]=	NA
Silver	9.01E-11	x		=	NA	1.05E-09	/[		x	1000	]=	NA
Strontium	5.03E-08	x		=	NA	5.87E-07	/[		x	1000	]=	NA
Total Uranium	9.52E-10	x		=	NA	1.11E-08	/[	4.00E-05	x	1000	]=	2.78E-07
Vanadium	8.84E-08	x		=	NA	1.03E-06	/[	1.00E-04	x	1000	]=	1.03E-05
Zinc	5.75E-08	x				6.71E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	9.09E-11	x	0.00E+00	=	0.00E+00	1.06E-09	/		x	1000	]=	NA
			Pathway total =		1.43E-09					Pathway total =		2.03E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.87E-06	x	1.50E+00	=	2.81E-06	2.19E-05	/	3.00E-04	=	7.29E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.42E-10	x		=	NA	5.16E-09	/	2.50E-05	=	2.06E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	2.38E-08	x	1.90E-03	=	4.52E-11	2.78E-07	/	2.00E-01	=	1.39E-06
			Pathway total =		2.81E-06			Pathway total =		7.31E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.2E-01**	5%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-02	1%
Arsenic	Sum of all pathways	=	**3.77E-05**	Sum of all pathways	=	**9.8E-01**	39%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-03	0%
Beryllium	Sum of all pathways	=	1.09E-12	Sum of all pathways	=	2.6E-03	0%
Cadmium	Sum of all pathways	=	3.04E-13	Sum of all pathways	=	2.1E-03	0%
Chromium	Sum of all pathways	=	1.21E-09	Sum of all pathways	=	**5.5E-02**	2%
Cobalt	Sum of all pathways	=	1.11E-10	Sum of all pathways	=	**4.7E-01**	19%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	7.3E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**5.2E-01**	21%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**7.7E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**4.1E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-10	0%
Nickel	Sum of all pathways	=	3.81E-12	Sum of all pathways	=	8.3E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-05	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**2.0E-01**	8%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.13E-10	Sum of all pathways	=	6.5E-06	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**3.77E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**2.52E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	8.13E-03	=	[	7.42E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	1.95E-07	=	[	1.78E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	5.70E-06	=	[	5.20E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	8.59E-05	=	[	7.84E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	1.74E-07	=	[	1.59E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Boron	3.66E-06	=	[	3.34E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	3.57E-06	=	[	3.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.88E-05	=	[	1.72E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	9.67E-06	=	[	8.82E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.81E-05	=	[	1.65E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	1.62E-06	=	[	1.48E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.65E-02	=	[	2.42E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	1.00E-05	=	[	9.13E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	5.42E-04	=	[	4.95E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	2.54E-08	=	[	2.32E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.36E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	5.50E-06	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	1.53E-06	=	[	1.40E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	6.14E-07	=	[	5.60E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	9.32E-08	=	[	8.50E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	3.80E-05	=	[	3.47E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	9.06E-07	=	[	8.27E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	6.44E-05	=	[	5.88E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	4.91E-05	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	7.27E-09	=	[	6.63E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.36E-07	=	[	1.24E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	3.69E-10	=	[	3.37E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Aldrin	2.19E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	9.49E-02	=	[	7.42E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	2.28E-06	=	[	1.78E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	6.65E-05	=	[	5.20E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.00E-03	=	[	7.84E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	2.03E-06	=	[	1.59E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Boron	4.27E-05	=	[	3.34E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	4.17E-05	=	[	3.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	2.20E-04	=	[	1.72E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.13E-04	=	[	8.82E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	2.11E-04	=	[	1.65E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	1.89E-05	=	[	1.48E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.09E-01	=	[	2.42E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.17E-04	=	[	9.13E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	6.33E-03	=	[	4.95E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	2.97E-07	=	[	2.32E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.59E-04	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	6.42E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	1.79E-05	=	[	1.40E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	7.16E-06	=	[	5.60E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	1.09E-06	=	[	8.50E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.44E-04	=	[	3.47E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.06E-05	=	[	8.27E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	7.52E-04	=	[	5.88E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	5.73E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	8.48E-08	=	[	6.63E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	1.59E-06	=	[	1.24E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	4.31E-09	=	[	3.37E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Aldrin	2.56E-08	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.35E-06	=	[	1.0E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.00E-10	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.85E-09	=	[	7.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	8.83E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.79E-10	=	[	2.2E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	3.76E-09	=	[	4.6E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	3.67E-09	=	[	4.5E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.94E-08	=	[	2.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.93E-09	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.86E-08	=	[	2.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.67E-09	=	[	2.0E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.72E-05	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.03E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.57E-07	=	[	6.8E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.61E-11	=	[	3.2E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.40E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	5.65E-09	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.58E-09	=	[	1.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	6.31E-10	=	[	7.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.57E-11	=	[	1.2E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.91E-08	=	[	4.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.31E-10	=	[	1.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.62E-08	=	[	8.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.04E-08	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.46E-12	=	[	9.1E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.40E-10	=	[	1.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.79E-13	=	[	4.6E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aldrin	2.25E-12	=	[	2.7E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.75E-05	=	[	1.0E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.34E-09	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.83E-08	=	[	7.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.03E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.09E-09	=	[	2.2E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	4.39E-08	=	[	4.6E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.28E-08	=	[	4.5E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.26E-07	=	[	2.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.16E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.17E-07	=	[	2.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	1.94E-08	=	[	2.0E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.18E-04	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.20E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	6.50E-06	=	[	6.8E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	3.05E-10	=	[	3.2E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.63E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	6.59E-08	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.84E-08	=	[	1.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	7.36E-09	=	[	7.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.12E-09	=	[	1.2E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.56E-07	=	[	4.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.09E-08	=	[	1.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.72E-07	=	[	8.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.88E-07	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.71E-11	=	[	9.1E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.63E-09	=	[	1.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	4.43E-12	=	[	4.6E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aldrin	2.63E-11	=	[	2.7E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	4.60E-07	=	[	5.20E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	9.61E-09	=	[	3.26E+00	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	3.66E-08	=	[	1.24E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Aldrin	5.90E-10	=	[	2.00E-03	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	5.37E-06	=	[	5.20E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.12E-07	=	[	3.26E+00	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	4.26E-07	=	[	1.24E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Aldrin	6.88E-09	=	[	2.00E-03	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	8.13E-03	x	0.00E+00	=	0.00E+00	9.49E-02	/	1.00E+00	=	9.49E-02
Antimony	1.95E-07	x	0.00E+00	=	0.00E+00	2.28E-06	/	4.00E-04	=	5.69E-03
Arsenic	5.70E-06	x	1.50E+00	=	8.55E-06	6.65E-05	/	3.00E-04	=	2.22E-01
Barium	8.59E-05	x	0.00E+00	=	0.00E+00	1.00E-03	/	2.00E-01	=	5.01E-03
Beryllium	1.74E-07	x	0.00E+00	=	0.00E+00	2.03E-06	/	2.00E-03	=	1.02E-03
Boron	3.66E-06	x	0.00E+00	=	0.00E+00	4.27E-05	/	2.00E-01	=	2.14E-04
Cadmium	3.57E-06	x	0.00E+00	=	0.00E+00	4.17E-05	/	1.00E-03	=	4.17E-02
Chromium	1.88E-05	x	0.00E+00	=	0.00E+00	2.20E-04	/	3.00E-03	=	7.33E-02
Cobalt	9.67E-06	x	0.00E+00	=	0.00E+00	1.13E-04	/	3.00E-04	=	3.76E-01
Copper	1.81E-05	x	0.00E+00	=	0.00E+00	2.11E-04	/	4.00E-02	=	5.27E-03
Fluoride	1.62E-06	x	0.00E+00	=	0.00E+00	1.89E-05	/	4.00E-02	=	4.73E-04
Iron	2.65E-02	x	0.00E+00	=	0.00E+00	3.09E-01	/	7.00E-01	=	4.42E-01
Lithium	1.00E-05	x	0.00E+00	=	0.00E+00	1.17E-04	/	2.00E-03	=	5.84E-02
Manganese	5.42E-04	x	0.00E+00	=	0.00E+00	6.33E-03	/	1.40E-01	=	4.52E-02
Mercury	2.54E-08	x	0.00E+00	=	0.00E+00	2.97E-07	/	0.00E+00	=	NA
Nickel	1.36E-05	x	0.00E+00	=	0.00E+00	1.59E-04	/	2.00E-02	=	7.93E-03
Nitrate	5.50E-06	x	0.00E+00	=	0.00E+00	6.42E-05	/	7.10E+00	=	9.04E-06
Nitrite	1.53E-06	x	0.00E+00	=	0.00E+00	1.79E-05	/	3.00E-01	=	5.97E-05
Selenium	6.14E-07	x	0.00E+00	=	0.00E+00	7.16E-06	/	5.00E-03	=	1.43E-03
Silver	9.32E-08	x	0.00E+00	=	0.00E+00	1.09E-06	/	5.00E-03	=	2.17E-04
Strontium	3.80E-05	x	0.00E+00	=	0.00E+00	4.44E-04	/	6.00E-01	=	7.39E-04
Total Uranium	9.06E-07	x	0.00E+00	=	0.00E+00	1.06E-05	/	3.00E-03	=	3.53E-03
Vanadium	6.44E-05	x	0.00E+00	=	0.00E+00	7.52E-04	/	5.00E-03	=	1.50E-01
Zinc	4.91E-05	x	0.00E+00	=	0.00E+00	5.73E-04	/	3.00E-01	=	1.91E-03
Acetone	7.27E-09	x	0.00E+00	=	0.00E+00	8.48E-08	/	9.00E-01	=	9.42E-08
Butylbenzylphthalate	1.36E-07	x	1.90E-03	=	2.58E-10	1.59E-06	/	2.00E-01	=	7.93E-06
Toluene	3.69E-10	x	0.00E+00	=	0.00E+00	4.31E-09	/	8.00E-02	=	5.39E-08
Aldrin	2.19E-09	x	1.70E+01	=	3.73E-08	2.56E-08	/	3.00E-05	=	8.52E-04
			Pathway total	=	8.59E-06			Pathway total	=	1.54E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.35E-06	x		=	NA	9.75E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	2.00E-10	x		=	NA	2.34E-09	/[		x	1000	]=	NA
Arsenic	5.85E-09	x	4.30E-03	=	2.52E-11	6.83E-08	/[	1.50E-05	x	1000	]=	4.55E-06
Barium	8.83E-08	x		=	NA	1.03E-06	/[	5.00E-04	x	1000	]=	2.06E-06
Beryllium	1.79E-10	x	2.40E-03	=	4.30E-13	2.09E-09	/[	2.00E-05	x	1000	]=	1.04E-07
Boron	3.76E-09	x	0.00E+00	=	0.00E+00	4.39E-08	/[	2.00E-02	x	1000	]=	2.19E-09
Cadmium	3.67E-09	x	1.80E-03	=	6.61E-12	4.28E-08	/[	1.00E-05	x	1001	]=	4.28E-06
Chromium	1.94E-08	x	8.40E-02	=	1.63E-09	2.26E-07	/[	1.00E-04	x	1002	]=	2.25E-06
Cobalt	9.93E-09	x	9.00E-03	=	8.94E-11	1.16E-07	/[	6.00E-06	x	1003	]=	1.93E-05
Copper	1.86E-08	x		=	NA	2.17E-07	/[		x	1004	]=	NA
Fluoride	1.67E-09	x		=	NA	1.94E-08	/[	1.30E-02	x	1005	]=	1.49E-09
Iron	2.72E-05	x		=	NA	3.18E-04	/[		x	1000	]=	NA
Lithium	1.03E-08	x		=	NA	1.20E-07	/[		x	1000	]=	NA
Manganese	5.57E-07	x		=	NA	6.50E-06	/[	5.00E-05	x	1000	]=	1.30E-04
Mercury	2.61E-11	x	0.00E+00	=	0.00E+00	3.05E-10	/[	3.00E-04	x	1000	]=	1.02E-09
Nickel	1.40E-08	x	2.60E-04	=	3.63E-12	1.63E-07	/[	9.00E-05	x	1000	]=	1.81E-06
Nitrate	5.65E-09	x		=	NA	6.59E-08	/[		x	1000	]=	NA
Nitrite	1.58E-09	x		=	NA	1.84E-08	/[		x	1000	]=	NA
Selenium	6.31E-10	x	0.00E+00	=	0.00E+00	7.36E-09	/[	2.00E-02	x	1000	]=	3.68E-10
Silver	9.57E-11	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	3.91E-08	x		=	NA	4.56E-07	/[		x	1000	]=	NA
Total Uranium	9.31E-10	x		=	NA	1.09E-08	/[	4.00E-05	x	1000	]=	2.72E-07
Vanadium	6.62E-08	x		=	NA	7.72E-07	/[	1.00E-04	x	1000	]=	7.72E-06
Zinc	5.04E-08	x		=	NA	5.88E-07	/[		x	1000	]=	NA
Acetone	7.46E-12	x	0.00E+00	=	0.00E+00	8.71E-11	/[	3.10E+01	x	1000	]=	2.81E-15
Butylbenzylphthalate	1.40E-10	x	0.00E+00	=	0.00E+00	1.63E-09	/[		x	1000	]=	NA
Toluene	3.79E-13	x	0.00E+00	=	0.00E+00	4.43E-12	/[	5.00E+00	x	1000	]=	8.85E-16
Aldrin	2.25E-12	x	4.90E-03	=	1.10E-14	2.63E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.75E-09					Pathway total =		1.92E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.60E-07	x	1.50E+00	=	6.90E-07	5.37E-06	/	3.00E-04	=	1.79E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	9.61E-09	x		=	NA	1.12E-07	/	2.50E-05	=	4.48E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.66E-08	x	1.90E-03	=	6.95E-11	4.26E-07	/	2.00E-01	=	2.13E-06
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	5.90E-10	x	1.70E+01	=	1.00E-08	6.88E-09	/	3.00E-05	=	2.29E-04
			Pathway total =		7.00E-07			Pathway total =		2.26E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**9.5E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	5.7E-03	0%
Arsenic	Sum of all pathways	=	9.24E-06	Sum of all pathways	=	**2.4E-01**	15%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-03	0%
Beryllium	Sum of all pathways	=	4.30E-13	Sum of all pathways	=	1.0E-03	0%
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04	0%
Cadmium	Sum of all pathways	=	6.61E-12	Sum of all pathways	=	**4.6E-02**	3%
Chromium	Sum of all pathways	=	1.63E-09	Sum of all pathways	=	**7.3E-02**	5%
Cobalt	Sum of all pathways	=	8.94E-11	Sum of all pathways	=	**3.8E-01**	24%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.4E-01**	28%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.8E-02**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**4.5E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-09	0%
Nickel	Sum of all pathways	=	3.63E-12	Sum of all pathways	=	7.9E-03	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-06	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-05	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.4E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.5E-01**	10%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	9.4E-08	0%
Butylbenzylphthalate	Sum of all pathways	=	3.28E-10	Sum of all pathways	=	1.0E-05	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	5.4E-08	0%
Aldrin	Sum of all pathways	=	4.73E-08	Sum of all pathways	=	1.1E-03	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**9.29E-06**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.56E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	7.41E-03	=	[	6.76E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.71E-07	=	[	2.47E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	3.82E-06	=	[	3.49E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	1.03E-04	=	[	9.41E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	3.27E-07	=	[	2.98E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.28E-07	=	[	1.17E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	9.84E-06	=	[	8.98E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	8.97E-06	=	[	8.18E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.43E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	2.31E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.62E-02	=	[	2.39E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	8.14E-06	=	[	7.43E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	4.23E-04	=	[	3.86E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	3.33E-08	=	[	3.04E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.23E-05	=	[	1.13E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	7.84E-06	=	[	7.15E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	3.35E-06	=	[	3.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	8.96E-08	=	[	8.18E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	3.96E-05	=	[	3.62E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Tin	6.97E-06	=	[	6.36E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	7.84E-07	=	[	7.15E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	7.64E-05	=	[	6.97E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	4.20E-05	=	[	3.83E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
2-Butanone	2.72E-09	=	[	2.48E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.42E-06	=	[	4.03E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	6.49E-08	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Hexane	3.93E-08	=	[	3.59E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	2.19E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
o-Xylene	1.40E-10	=	[	1.28E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	7.17E-10	=	[	6.54E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	1.07E-09	=	[	9.78E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Xylenes (total)	5.07E-10	=	[	4.63E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	2.77E-08	=	[	2.52E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Gamma-BHC (Lindane)	5.59E-09	=	[	5.10E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	2.26E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																				
Aluminum	8.64E-02	=	[6.76E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.16E-06	=	[2.47E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	4.46E-05	=	[3.49E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.20E-03	=	[9.41E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	3.81E-06	=	[2.98E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.49E-06	=	[1.17E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.15E-04	=	[8.98E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.05E-04	=	[8.18E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.67E-04	=	[1.30E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	2.70E-05	=	[2.11E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.06E-01	=	[2.39E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	9.50E-05	=	[7.43E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.94E-03	=	[3.86E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	3.89E-07	=	[3.04E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.44E-04	=	[1.13E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	9.15E-05	=	[7.15E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	3.91E-05	=	[3.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	1.05E-06	=	[8.18E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.63E-04	=	[3.62E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Tin	8.13E-05	=	[6.36E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	9.15E-06	=	[7.15E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	8.92E-04	=	[6.97E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	4.90E-04	=	[3.83E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
2-Butanone	3.18E-08	=	[2.48E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	5.16E-05	=	[4.03E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	7.57E-07	=	[5.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Hexane	4.59E-07	=	[3.59E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	2.56E-08	=	[2.00E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
o-Xylene	1.64E-09	=	[1.28E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	8.36E-09	=	[6.54E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	1.25E-08	=	[9.78E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Xylenes (total)	5.92E-09	=	[4.63E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	3.23E-07	=	[2.52E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Gamma-BHC (Lindane)	6.52E-08	=	[5.10E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	2.63E-07	=	[2.06E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.61E-06	=	[	9.3E-05	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.78E-10	=	[	3.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	3.93E-09	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.06E-07	=	[	1.3E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.36E-10	=	[	4.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.31E-10	=	[	1.6E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.01E-08	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.21E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.47E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.38E-09	=	[	2.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.70E-05	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.36E-09	=	[	1.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.35E-07	=	[	5.3E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	3.42E-11	=	[	4.2E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.27E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	8.06E-09	=	[	9.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.44E-09	=	[	4.2E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.21E-11	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.07E-08	=	[	5.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	7.16E-09	=	[	8.7E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	8.05E-10	=	[	9.8E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.85E-08	=	[	9.6E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.32E-08	=	[	5.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Butanone	2.80E-12	=	[	3.4E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	4.54E-09	=	[	5.5E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.67E-11	=	[	8.1E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	4.04E-11	=	[	4.9E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	2.25E-12	=	[	2.7E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
o-Xylene	1.44E-13	=	[	1.8E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	7.36E-13	=	[	9.0E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	1.10E-12	=	[	1.3E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.21E-13	=	[	6.3E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.84E-11	=	[	3.5E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	5.74E-12	=	[	7.0E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.32E-11	=	[	2.8E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.88E-05	=	[	9.3E-05	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.25E-09	=	[	3.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.58E-08	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.24E-06	=	[	1.3E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.91E-09	=	[	4.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.53E-09	=	[	1.6E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.18E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.07E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.71E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.77E-08	=	[	2.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.15E-04	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	9.76E-08	=	[	1.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.07E-06	=	[	5.3E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	3.99E-10	=	[	4.2E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.48E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	9.40E-08	=	[	9.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.02E-08	=	[	4.2E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.07E-09	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.75E-07	=	[	5.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	8.35E-08	=	[	8.7E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.40E-09	=	[	9.8E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	9.16E-07	=	[	9.6E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.04E-07	=	[	5.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Butanone	3.26E-11	=	[	3.4E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	5.30E-08	=	[	5.5E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	7.78E-10	=	[	8.1E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	4.72E-10	=	[	4.9E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	2.63E-11	=	[	2.7E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
o-Xylene	1.68E-12	=	[	1.8E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	8.59E-12	=	[	9.0E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	1.28E-11	=	[	1.3E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Xylenes (total)	6.08E-12	=	[	6.3E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.32E-10	=	[	3.5E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Gamma-BHC (Lindane)	6.70E-11	=	[	7.0E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	2.71E-10	=	[	2.8E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	3.08E-07	=	[	3.49E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	3.44E-10	=	[	1.17E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.19E-06	=	[	4.03E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.75E-08	=	[	5.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	7.44E-09	=	[	2.52E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Gamma-BHC (Lindane)	6.01E-10	=	[	5.10E-03	x	1.00E-06	x	2,690	x	0.2	x	0.04	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	8.50E-09	=	[	2.06E-02	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	3.60E-06	=	[	3.49E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	4.01E-09	=	[	1.17E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	1.39E-05	=	[	4.03E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.04E-07	=	[	5.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	8.68E-08	=	[	2.52E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Gamma-BHC (Lindane)	7.02E-09	=	[	5.10E-03	x	1.00E-06	x	2,690	x	0.2	x	0.04	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	9.92E-08	=	[	2.06E-02	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.41E-03	x	0.00E+00	=	0.00E+00	8.64E-02	/	1.00E+00	=	8.64E-02
Antimony	2.71E-07	x	0.00E+00	=	0.00E+00	3.16E-06	/	4.00E-04	=	7.90E-03
Arsenic	3.82E-06	x	1.50E+00	=	5.73E-06	4.46E-05	/	3.00E-04	=	1.49E-01
Barium	1.03E-04	x	0.00E+00	=	0.00E+00	1.20E-03	/	2.00E-01	=	6.02E-03
Beryllium	3.27E-07	x	0.00E+00	=	0.00E+00	3.81E-06	/	2.00E-03	=	1.91E-03
Cadmium	1.28E-07	x	0.00E+00	=	0.00E+00	1.49E-06	/	1.00E-03	=	1.49E-03
Chromium	9.84E-06	x	0.00E+00	=	0.00E+00	1.15E-04	/	3.00E-03	=	3.83E-02
Cobalt	8.97E-06	x	0.00E+00	=	0.00E+00	1.05E-04	/	3.00E-04	=	3.49E-01
Copper	1.43E-05	x	0.00E+00	=	0.00E+00	1.67E-04	/	4.00E-02	=	4.16E-03
Fluoride	2.31E-06	x	0.00E+00	=	0.00E+00	2.70E-05	/	4.00E-02	=	6.75E-04
Iron	2.62E-02	x	0.00E+00	=	0.00E+00	3.06E-01	/	7.00E-01	=	4.37E-01
Lithium	8.14E-06	x	0.00E+00	=	0.00E+00	9.50E-05	/	2.00E-03	=	4.75E-02
Manganese	4.23E-04	x	0.00E+00	=	0.00E+00	4.94E-03	/	1.40E-01	=	3.53E-02
Mercury	3.33E-08	x	0.00E+00	=	0.00E+00	3.89E-07	/	0.00E+00	=	NA
Nickel	1.23E-05	x	0.00E+00	=	0.00E+00	1.44E-04	/	2.00E-02	=	7.19E-03
Nitrate	7.84E-06	x	0.00E+00	=	0.00E+00	9.15E-05	/	7.10E+00	=	1.29E-05
Nitrite	3.35E-06	x	0.00E+00	=	0.00E+00	3.91E-05	/	3.00E-01	=	1.30E-04
Silver	8.96E-08	x	0.00E+00	=	0.00E+00	1.05E-06	/	5.00E-03	=	2.09E-04
Strontium	3.96E-05	x	0.00E+00	=	0.00E+00	4.63E-04	/	6.00E-01	=	7.71E-04
Tin	6.97E-06	x	0.00E+00	=	0.00E+00	8.13E-05	/	6.00E-01	=	1.36E-04
Total Uranium	7.84E-07	x	0.00E+00	=	0.00E+00	9.15E-06	/	3.00E-03	=	3.05E-03
Vanadium	7.64E-05	x	0.00E+00	=	0.00E+00	8.92E-04	/	5.00E-03	=	1.78E-01
Zinc	4.20E-05	x	0.00E+00	=	0.00E+00	4.90E-04	/	3.00E-01	=	1.63E-03
2-Butanone	2.72E-09	x	0.00E+00	=	0.00E+00	3.18E-08	/	6.00E-01	=	5.30E-08
Bis(2-ethylhexyl) phthalate	4.42E-06	x	1.40E-02	=	6.19E-08	5.16E-05	/	2.00E-02	=	2.58E-03
Butylbenzylphthalate	6.49E-08	x	1.90E-03	=	1.23E-10	7.57E-07	/	2.00E-01	=	3.79E-06
Hexane	3.93E-08	x	0.00E+00	=	0.00E+00	4.59E-07	/	6.00E-02	=	7.65E-06
Methylene chloride	2.19E-09	x	2.00E-03	=	4.38E-12	2.56E-08	/	6.00E-03	=	4.26E-06
o-Xylene	1.40E-10	x	0.00E+00	=	0.00E+00	1.64E-09	/	2.00E-01	=	8.18E-09
Styrene	7.17E-10	x	0.00E+00	=	0.00E+00	8.36E-09	/	2.00E-01	=	4.18E-08
Toluene	1.07E-09	x	0.00E+00	=	0.00E+00	1.25E-08	/	8.00E-02	=	1.56E-07
Xylenes (total)	5.07E-10	x	0.00E+00	=	0.00E+00	5.92E-09	/	2.00E-01	=	2.96E-08
beta-BHC	2.77E-08	x	1.80E+00	=	4.98E-08	3.23E-07	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	5.59E-09	x	1.10E+00	=	6.15E-09	6.52E-08	/	3.00E-04	=	2.17E-04
Aroclor-1260	2.26E-08	x	2.00E+00	=	4.52E-08	2.63E-07	/	0.00E+00	=	NA
			Pathway total	=	5.90E-06			Pathway total	=	1.36E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.61E-06	x		=	NA	8.88E-05	/[	5.00E-03	x	1000	]=	1.78E-05
Antimony	2.78E-10	x		=	NA	3.25E-09	/[		x	1000	]=	NA
Arsenic	3.93E-09	x	4.30E-03	=	1.69E-11	4.58E-08	/[	1.50E-05	x	1000	]=	3.05E-06
Barium	1.06E-07	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.47E-06
Beryllium	3.36E-10	x	2.40E-03	=	8.05E-13	3.91E-09	/[	2.00E-05	x	1000	]=	1.96E-07
Cadmium	1.31E-10	x	1.80E-03	=	2.36E-13	1.53E-09	/[	1.00E-05	x	1000	]=	1.53E-07
Chromium	1.01E-08	x	8.40E-02	=	8.49E-10	1.18E-07	/[	1.00E-04	x	1000	]=	1.18E-06
Cobalt	9.21E-09	x	9.00E-03	=	8.29E-11	1.07E-07	/[	6.00E-06	x	1000	]=	1.79E-05
Copper	1.47E-08	x		=	NA	1.71E-07	/[		x	1000	]=	NA
Fluoride	2.38E-09	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	2.70E-05	x		=	NA	3.15E-04	/[		x	1000	]=	NA
Lithium	8.36E-09	x		=	NA	9.76E-08	/[		x	1000	]=	NA
Manganese	4.35E-07	x		=	NA	5.07E-06	/[	5.00E-05	x	1000	]=	1.01E-04
Mercury	3.42E-11	x	0.00E+00	=	0.00E+00	3.99E-10	/[	3.00E-04	x	1000	]=	1.33E-09
Nickel	1.27E-08	x	2.60E-04	=	3.29E-12	1.48E-07	/[	9.00E-05	x	1000	]=	1.64E-06
Nitrate	8.06E-09	x		=	NA	9.40E-08	/[		x	1000	]=	NA
Nitrite	3.44E-09	x		=	NA	4.02E-08	/[		x	1000	]=	NA
Silver	9.21E-11	x		=	NA	1.07E-09	/[		x	1000	]=	NA
Strontium	4.07E-08	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Tin	7.16E-09	x		=	NA	8.35E-08	/[		x	1000	]=	NA
Total Uranium	8.05E-10	x		=	NA	9.40E-09	/[	4.00E-05	x	1000	]=	2.35E-07
Vanadium	7.85E-08	x		=	NA	9.16E-07	/[	1.00E-04	x	1000	]=	9.16E-06
Zinc	4.32E-08	x		=	NA	5.04E-07	/[		x	1000	]=	NA
2-Butanone	2.80E-12	x	0.00E+00	=	0.00E+00	3.26E-11	/[	5.00E+00	x	1000	]=	6.53E-15
Bis(2-ethylhexyl) phthalate	4.54E-09	x	2.40E-06	=	1.09E-14	5.30E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.67E-11	x	0.00E+00	=	0.00E+00	7.78E-10	/[		x	1000	]=	NA
Hexane	4.04E-11	x	0.00E+00	=	0.00E+00	4.72E-10	/[	7.00E-01	x	1000	]=	6.74E-13
Methylene chloride	2.25E-12	x	1.00E-08	=	2.25E-20	2.63E-11	/[	6.00E-01	x	1000	]=	4.38E-14
o-Xylene	1.44E-13	x	0.00E+00	=	0.00E+00	1.68E-12	/[	1.00E-01	x	1000	]=	1.68E-14
Styrene	7.36E-13	x	0.00E+00	=	0.00E+00	8.59E-12	/[	1.00E+00	x	1000	]=	8.59E-15
Toluene	1.10E-12	x	0.00E+00	=	0.00E+00	1.28E-11	/[	5.00E+00	x	1000	]=	2.57E-15
Xylenes (total)	5.21E-13	x	0.00E+00	=	0.00E+00	6.08E-12	/[	1.00E-01	x	1000	]=	6.08E-14
beta-BHC	2.84E-11	x	5.30E-04	=	1.51E-14	3.32E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	5.74E-12	x	3.10E-04	=	1.78E-15	6.70E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.32E-11	x	5.70E-04	=	1.32E-14	2.71E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.53E-10					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.08E-07	x	1.50E+00	=	4.63E-07	3.60E-06	/	3.00E-04	=	1.20E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.44E-10	x		=	NA	4.01E-09	/	2.50E-05	=	1.60E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	1.19E-06	x	1.40E-02	=	1.66E-08	1.39E-05	/	2.00E-02	=	6.93E-04
Butylbenzylphthalate	1.75E-08	x	1.90E-03	=	3.32E-11	2.04E-07	/	2.00E-01	=	1.02E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	7.44E-09	x	1.80E+00	=	1.34E-08	8.68E-08	/		=	NA
Gamma-BHC (Lindane)	6.01E-10	x	1.10E+00	=	6.62E-10	7.02E-09	/	3.00E-04	=	2.34E-05
Aroclor-1260	8.50E-09	x	2.00E+00	=	1.70E-08	9.92E-08	/		=	NA
			Pathway total =		5.10E-07			Pathway total =		1.29E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**8.6E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-03	1%
Arsenic	Sum of all pathways	=	6.20E-06	Sum of all pathways	=	**1.6E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-03	0%
Beryllium	Sum of all pathways	=	8.05E-13	Sum of all pathways	=	1.9E-03	0%
Cadmium	Sum of all pathways	=	2.36E-13	Sum of all pathways	=	1.7E-03	0%
Chromium	Sum of all pathways	=	8.49E-10	Sum of all pathways	=	**3.8E-02**	3%
Cobalt	Sum of all pathways	=	8.29E-11	Sum of all pathways	=	**3.5E-01**	25%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.4E-01**	32%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**4.7E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.5E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-09	0%
Nickel	Sum of all pathways	=	3.29E-12	Sum of all pathways	=	7.2E-03	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-04	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.8E-01**	13%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03	0%
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-08	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.85E-08	Sum of all pathways	=	3.3E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.57E-10	Sum of all pathways	=	4.8E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-06	0%
Methylene chloride	Sum of all pathways	=	4.38E-12	Sum of all pathways	=	4.3E-06	0%
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-09	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-07	0%
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	3.0E-08	0%
beta-BHC	Sum of all pathways	=	6.32E-08	Sum of all pathways	=	**NA**	
Gamma-BHC (Lindane)	Sum of all pathways	=	6.81E-09	Sum of all pathways	=	2.4E-04	0%
Aroclor-1260	Sum of all pathways	=	6.22E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	6.41E-06	All Pathways and Chemicals	=	**1.37E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	7.68E-03	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.80E-07	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	5.50E-06	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	9.91E-05	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	2.18E-07	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.51E-07	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.84E-05	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	1.12E-05	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.34E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	1.82E-06	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.86E-02	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	8.29E-06	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	4.47E-04	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	2.19E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.43E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	3.56E-05	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	1.42E-06	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	1.08E-06	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	7.18E-08	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	3.66E-05	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	5.98E-07	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	7.25E-05	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	4.91E-05	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.19E-07	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	6.25E-07	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	4.32E-10	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	6.77E-10	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	8.96E-02	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.27E-06	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	6.42E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.16E-03	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	2.54E-06	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.76E-06	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	2.15E-04	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.30E-04	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.56E-04	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	2.12E-05	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.34E-01	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	9.67E-05	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	5.22E-03	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	2.56E-05	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.67E-04	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	4.15E-04	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	1.66E-05	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	1.26E-05	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	8.37E-07	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.27E-04	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	6.97E-06	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	8.46E-04	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	5.73E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.56E-06	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	7.29E-06	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	5.04E-09	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	7.90E-09	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.89E-06	=	[	9.6E-05	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.88E-10	=	[	3.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.65E-09	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.02E-07	=	[	1.2E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.24E-10	=	[	2.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.55E-10	=	[	1.9E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.89E-08	=	[	2.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.15E-08	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.37E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.87E-09	=	[	2.3E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.94E-05	=	[	3.6E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.52E-09	=	[	1.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.59E-07	=	[	5.6E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.25E-09	=	[	2.7E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.47E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	3.65E-08	=	[	4.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.46E-09	=	[	1.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.11E-09	=	[	1.3E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.37E-11	=	[	9.0E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.76E-08	=	[	4.6E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.14E-10	=	[	7.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.45E-08	=	[	9.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.04E-08	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.25E-10	=	[	2.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	6.42E-10	=	[	7.8E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.44E-13	=	[	5.4E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	6.96E-13	=	[	8.5E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.20E-05	=	[	9.6E-05	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.36E-09	=	[	3.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.59E-08	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.19E-06	=	[	1.2E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.61E-09	=	[	2.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.81E-09	=	[	1.9E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.21E-07	=	[	2.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.34E-07	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.18E-08	=	[	2.3E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.43E-04	=	[	3.6E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	9.93E-08	=	[	1.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.36E-06	=	[	5.6E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	2.63E-08	=	[	2.7E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.72E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	4.26E-07	=	[	4.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.71E-08	=	[	1.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.29E-08	=	[	1.3E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.60E-10	=	[	9.0E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.39E-07	=	[	4.6E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.16E-09	=	[	7.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.69E-07	=	[	9.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.88E-07	=	[	6.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	2.63E-09	=	[	2.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	7.49E-09	=	[	7.8E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	5.17E-12	=	[	5.4E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	8.12E-12	=	[	8.5E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	4.44E-07	=	[	5.02E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	4.05E-10	=	[	1.37E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	5.90E-08	=	[	2.00E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	1.68E-07	=	[	5.70E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	5.18E-06	=	[	5.02E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	4.73E-09	=	[	1.37E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	6.88E-07	=	[	2.00E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	1.96E-06	=	[	5.70E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.68E-03	x	0.00E+00	=	0.00E+00	8.96E-02	/	1.00E+00	=	8.96E-02
Antimony	2.80E-07	x	0.00E+00	=	0.00E+00	3.27E-06	/	4.00E-04	=	8.18E-03
Arsenic	5.50E-06	x	1.50E+00	=	8.25E-06	6.42E-05	/	3.00E-04	=	**2.14E-01**
Barium	9.91E-05	x	0.00E+00	=	0.00E+00	1.16E-03	/	2.00E-01	=	5.78E-03
Beryllium	2.18E-07	x	0.00E+00	=	0.00E+00	2.54E-06	/	2.00E-03	=	1.27E-03
Cadmium	1.51E-07	x	0.00E+00	=	0.00E+00	1.76E-06	/	1.00E-03	=	1.76E-03
Chromium	1.84E-05	x	0.00E+00	=	0.00E+00	2.15E-04	/	3.00E-03	=	7.16E-02
Cobalt	1.12E-05	x	0.00E+00	=	0.00E+00	1.30E-04	/	3.00E-04	=	**4.34E-01**
Copper	1.34E-05	x	0.00E+00	=	0.00E+00	1.56E-04	/	4.00E-02	=	3.90E-03
Fluoride	1.82E-06	x	0.00E+00	=	0.00E+00	2.12E-05	/	4.00E-02	=	5.30E-04
Iron	2.86E-02	x	0.00E+00	=	0.00E+00	3.34E-01	/	7.00E-01	=	**4.77E-01**
Lithium	8.29E-06	x	0.00E+00	=	0.00E+00	9.67E-05	/	2.00E-03	=	4.83E-02
Manganese	4.47E-04	x	0.00E+00	=	0.00E+00	5.22E-03	/	1.40E-01	=	3.73E-02
Molybdenum	2.19E-06	x	0.00E+00	=	0.00E+00	2.56E-05	/	5.00E-03	=	5.11E-03
Nickel	1.43E-05	x	0.00E+00	=	0.00E+00	1.67E-04	/	2.00E-02	=	8.36E-03
Nitrate	3.56E-05	x	0.00E+00	=	0.00E+00	4.15E-04	/	7.10E+00	=	5.84E-05
Nitrite	1.42E-06	x	0.00E+00	=	0.00E+00	1.66E-05	/	3.00E-01	=	5.54E-05
Selenium	1.08E-06	x	0.00E+00	=	0.00E+00	1.26E-05	/	5.00E-03	=	2.51E-03
Silver	7.18E-08	x	0.00E+00	=	0.00E+00	8.37E-07	/	5.00E-03	=	1.67E-04
Strontium	3.66E-05	x	0.00E+00	=	0.00E+00	4.27E-04	/	6.00E-01	=	7.12E-04
Total Uranium	5.98E-07	x	0.00E+00	=	0.00E+00	6.97E-06	/	3.00E-03	=	2.32E-03
Vanadium	7.25E-05	x	0.00E+00	=	0.00E+00	8.46E-04	/	5.00E-03	=	**1.69E-01**
Zinc	4.91E-05	x	0.00E+00	=	0.00E+00	5.73E-04	/	3.00E-01	=	1.91E-03
Butylbenzylphthalate	2.19E-07	x	1.90E-03	=	4.16E-10	2.56E-06	/	2.00E-01	=	1.28E-05
Di-n-butylphthalate	6.25E-07	x	0.00E+00	=	0.00E+00	7.29E-06	/	1.00E-01	=	7.29E-05
Styrene	4.32E-10	x	0.00E+00	=	0.00E+00	5.04E-09	/	2.00E-01	=	2.52E-08
Toluene	6.77E-10	x	0.00E+00	=	0.00E+00	7.90E-09	/	8.00E-02	=	9.88E-08
			Pathway total	=	8.25E-06			Pathway total	=	**1.58E+00**

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.89E-06	x		=	NA	9.20E-05	/[	5.00E-03	x	1000	]=	1.84E-05
Antimony	2.88E-10	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	5.65E-09	x	4.30E-03	=	2.43E-11	6.59E-08	/[	1.50E-05	x	1000	]=	4.40E-06
Barium	1.02E-07	x		=	NA	1.19E-06	/[	5.00E-04	x	1000	]=	2.38E-06
Beryllium	2.24E-10	x	2.40E-03	=	5.37E-13	2.61E-09	/[	2.00E-05	x	1001	]=	1.30E-07
Cadmium	1.55E-10	x	1.80E-03	=	2.79E-13	1.81E-09	/[	1.00E-05	x	1002	]=	1.80E-07
Chromium	1.89E-08	x	8.40E-02	=	1.59E-09	2.21E-07	/[	1.00E-04	x	1003	]=	2.20E-06
Cobalt	1.15E-08	x	9.00E-03	=	1.03E-10	1.34E-07	/[	6.00E-06	x	1004	]=	2.22E-05
Copper	1.37E-08	x		=	NA	1.60E-07	/[		x	1005	]=	NA
Fluoride	1.87E-09	x		=	NA	2.18E-08	/[	1.30E-02	x	1000	]=	1.67E-09
Iron	2.94E-05	x		=	NA	3.43E-04	/[		x	1000	]=	NA
Lithium	8.52E-09	x		=	NA	9.93E-08	/[		x	1000	]=	NA
Manganese	4.59E-07	x		=	NA	5.36E-06	/[	5.00E-05	x	1000	]=	1.07E-04
Molybdenum	2.25E-09	x	0.00E+00	=	0.00E+00	2.63E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.47E-08	x	2.60E-04	=	3.83E-12	1.72E-07	/[	9.00E-05	x	1000	]=	1.91E-06
Nitrate	3.65E-08	x		=	NA	4.26E-07	/[		x	1000	]=	NA
Nitrite	1.46E-09	x		=	NA	1.71E-08	/[		x	1000	]=	NA
Selenium	1.11E-09	x	0.00E+00	=	0.00E+00	1.29E-08	/[	2.00E-02	x	1000	]=	6.45E-10
Silver	7.37E-11	x		=	NA	8.60E-10	/[		x	1000	]=	NA
Strontium	3.76E-08	x		=	NA	4.39E-07	/[		x	1000	]=	NA
Total Uranium	6.14E-10	x		=	NA	7.16E-09	/[	4.00E-05	x	1000	]=	1.79E-07
Vanadium	7.45E-08	x		=	NA	8.69E-07	/[	1.00E-04	x	1000	]=	8.69E-06
Zinc	5.04E-08	x		=	NA	5.88E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.25E-10	x	0.00E+00	=	0.00E+00	2.63E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	6.42E-10	x	0.00E+00	=	0.00E+00	7.49E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.44E-13	x	0.00E+00	=	0.00E+00	5.17E-12	/[	1.00E+00	x	1000	]=	5.17E-15
Toluene	6.96E-13	x	0.00E+00	=	0.00E+00	8.12E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		1.72E-09					Pathway total =		1.68E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.44E-07	x	1.50E+00	=	6.66E-07	5.18E-06	/	3.00E-04	=	1.73E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.05E-10	x		=	NA	4.73E-09	/	2.50E-05	=	1.89E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	5.90E-08	x	1.90E-03	=	1.12E-10	6.88E-07	/	2.00E-01	=	3.44E-06
Di-n-butylphthalate	1.68E-07	x		=	NA	1.96E-06	/	1.00E-01	=	1.96E-05
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		6.66E-07			Pathway total =		1.75E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**9.0E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-03	1%
Arsenic	Sum of all pathways	=	8.92E-06	Sum of all pathways	=	**2.3E-01**	14%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-03	0%
Beryllium	Sum of all pathways	=	5.37E-13	Sum of all pathways	=	1.3E-03	0%
Cadmium	Sum of all pathways	=	2.79E-13	Sum of all pathways	=	1.9E-03	0%
Chromium	Sum of all pathways	=	1.59E-09	Sum of all pathways	=	**7.2E-02**	4%
Cobalt	Sum of all pathways	=	1.03E-10	Sum of all pathways	=	**4.3E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.8E-01**	30%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**4.8E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.7E-02**	2%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03	0%
Nickel	Sum of all pathways	=	3.83E-12	Sum of all pathways	=	8.4E-03	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	5.5E-05	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.7E-01**	11%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	5.28E-10	Sum of all pathways	=	1.6E-05	0%
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	9.2E-05	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	9.9E-08	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	8.92E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.60E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	8.48E-03	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.37E-06	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	8.65E-06	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	2.67E-04	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	3.59E-07	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Boron	4.81E-05	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.24E-07	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.27E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	9.06E-06	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.51E-05	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	1.68E-06	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.64E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	9.51E-06	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	4.20E-04	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	1.78E-08	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.50E-05	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	1.01E-05	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	2.74E-06	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	6.84E-08	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	1.37E-04	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Tin	3.95E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	7.13E-07	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	5.95E-05	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	5.73E-05	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.27E-06	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	8.53E-08	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	9.90E-02	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	2.76E-05	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	1.01E-04	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	3.12E-03	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	4.19E-06	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Boron	5.61E-04	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.44E-06	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.48E-04	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.06E-04	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.76E-04	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	1.96E-05	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.08E-01	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.11E-04	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.90E-03	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	2.07E-07	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.75E-04	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	1.18E-04	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	3.20E-05	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	7.98E-07	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	1.60E-03	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Tin	4.60E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	8.32E-06	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	6.94E-04	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	6.69E-04	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	2.65E-05	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	9.95E-07	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.71E-06	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.43E-09	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	8.88E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	2.75E-07	=	[	3.3E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.69E-10	=	[	4.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	4.94E-08	=	[	6.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.27E-10	=	[	1.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.31E-08	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.31E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.55E-08	=	[	1.9E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.72E-09	=	[	2.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.71E-05	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.77E-09	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.31E-07	=	[	5.2E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.82E-11	=	[	2.2E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.54E-08	=	[	1.9E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.04E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.81E-09	=	[	3.4E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.03E-11	=	[	8.5E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	1.41E-07	=	[	1.7E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	4.05E-09	=	[	4.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.32E-10	=	[	8.9E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.11E-08	=	[	7.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.89E-08	=	[	7.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.33E-09	=	[	2.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	8.76E-11	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.02E-04	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.84E-08	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	1.04E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	3.21E-06	=	[	3.3E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	4.31E-09	=	[	4.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	5.77E-07	=	[	6.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.48E-09	=	[	1.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.52E-07	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.09E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.81E-07	=	[	1.9E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.01E-08	=	[	2.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.17E-04	=	[	3.3E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.14E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.03E-06	=	[	5.2E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.13E-10	=	[	2.2E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.80E-07	=	[	1.9E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.21E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	3.28E-08	=	[	3.4E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.20E-10	=	[	8.5E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	1.64E-06	=	[	1.7E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	4.73E-08	=	[	4.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.54E-09	=	[	8.9E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.13E-07	=	[	7.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.87E-07	=	[	7.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.72E-08	=	[	2.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.02E-09	=	[	1.1E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	6.98E-07	=	[	7.89E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	3.33E-10	=	[	1.13E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.10E-07	=	[	2.07E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.29E-08	=	[	7.78E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	8.14E-06	=	[	7.89E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	3.89E-09	=	[	1.13E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	7.12E-06	=	[	2.07E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.68E-07	=	[	7.78E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	8.48E-03	x	0.00E+00	=	0.00E+00	9.90E-02	/	1.00E+00	=	9.90E-02
Antimony	2.37E-06	x	0.00E+00	=	0.00E+00	2.76E-05	/	4.00E-04	=	6.90E-02
Arsenic	8.65E-06	x	1.50E+00	=	1.30E-05	1.01E-04	/	3.00E-04	=	**3.36E-01**
Barium	2.67E-04	x	0.00E+00	=	0.00E+00	3.12E-03	/	2.00E-01	=	1.56E-02
Beryllium	3.59E-07	x	0.00E+00	=	0.00E+00	4.19E-06	/	2.00E-03	=	2.10E-03
Boron	4.81E-05	x	0.00E+00	=	0.00E+00	5.61E-04	/	2.00E-01	=	2.81E-03
Cadmium	1.24E-07	x	0.00E+00	=	0.00E+00	1.44E-06	/	1.00E-03	=	1.44E-03
Chromium	1.27E-05	x	0.00E+00	=	0.00E+00	1.48E-04	/	3.00E-03	=	4.94E-02
Cobalt	9.06E-06	x	0.00E+00	=	0.00E+00	1.06E-04	/	3.00E-04	=	**3.52E-01**
Copper	1.51E-05	x	0.00E+00	=	0.00E+00	1.76E-04	/	4.00E-02	=	4.41E-03
Fluoride	1.68E-06	x	0.00E+00	=	0.00E+00	1.96E-05	/	4.00E-02	=	4.89E-04
Iron	2.64E-02	x	0.00E+00	=	0.00E+00	3.08E-01	/	7.00E-01	=	**4.40E-01**
Lithium	9.51E-06	x	0.00E+00	=	0.00E+00	1.11E-04	/	2.00E-03	=	5.55E-02
Manganese	4.20E-04	x	0.00E+00	=	0.00E+00	4.90E-03	/	1.40E-01	=	3.50E-02
Mercury	1.78E-08	x	0.00E+00	=	0.00E+00	2.07E-07	/	0.00E+00	=	**NA**
Nickel	1.50E-05	x	0.00E+00	=	0.00E+00	1.75E-04	/	2.00E-02	=	8.76E-03
Nitrate	1.01E-05	x	0.00E+00	=	0.00E+00	1.18E-04	/	7.10E+00	=	1.66E-05
Nitrite	2.74E-06	x	0.00E+00	=	0.00E+00	3.20E-05	/	3.00E-01	=	1.07E-04
Silver	6.84E-08	x	0.00E+00	=	0.00E+00	7.98E-07	/	5.00E-03	=	1.60E-04
Strontium	1.37E-04	x	0.00E+00	=	0.00E+00	1.60E-03	/	6.00E-01	=	2.66E-03
Tin	3.95E-06	x	0.00E+00	=	0.00E+00	4.60E-05	/	6.00E-01	=	7.67E-05
Total Uranium	7.13E-07	x	0.00E+00	=	0.00E+00	8.32E-06	/	3.00E-03	=	2.77E-03
Vanadium	5.95E-05	x	0.00E+00	=	0.00E+00	6.94E-04	/	5.00E-03	=	**1.39E-01**
Zinc	5.73E-05	x	0.00E+00	=	0.00E+00	6.69E-04	/	3.00E-01	=	2.23E-03
Bis(2-ethylhexyl) phthalate	2.27E-06	x	1.40E-02	=	3.18E-08	2.65E-05	/	2.00E-02	=	1.32E-03
Butylbenzylphthalate	8.53E-08	x	1.90E-03	=	1.62E-10	9.95E-07	/	2.00E-01	=	4.97E-06
			Pathway total	=	1.30E-05			Pathway total	=	**1.62E+00**

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.71E-06	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	2.43E-09	x		=	NA	2.84E-08	/[		x	1000	]=	NA
Arsenic	8.88E-09	x	4.30E-03	=	3.82E-11	1.04E-07	/[	1.50E-05	x	1000	]=	6.91E-06
Barium	2.75E-07	x		=	NA	3.21E-06	/[	5.00E-04	x	1000	]=	6.41E-06
Beryllium	3.69E-10	x	2.40E-03	=	8.86E-13	4.31E-09	/[	2.00E-05	x	1000	]=	2.15E-07
Boron	4.94E-08	x	0.00E+00	=	0.00E+00	5.77E-07	/[	2.00E-02	x	1000	]=	2.88E-08
Cadmium	1.27E-10	x	1.80E-03	=	2.29E-13	1.48E-09	/[	1.00E-05	x	1000	]=	1.48E-07
Chromium	1.31E-08	x	8.40E-02	=	1.10E-09	1.52E-07	/[	1.00E-04	x	1000	]=	1.52E-06
Cobalt	9.31E-09	x	9.00E-03	=	8.38E-11	1.09E-07	/[	6.00E-06	x	1000	]=	1.81E-05
Copper	1.55E-08	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	1.72E-09	x		=	NA	2.01E-08	/[	1.30E-02	x	1000	]=	1.55E-09
Iron	2.71E-05	x		=	NA	3.17E-04	/[		x	1000	]=	NA
Lithium	9.77E-09	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	4.31E-07	x		=	NA	5.03E-06	/[	5.00E-05	x	1000	]=	1.01E-04
Mercury	1.82E-11	x	0.00E+00	=	0.00E+00	2.13E-10	/[	3.00E-04	x	1000	]=	7.09E-10
Nickel	1.54E-08	x	2.60E-04	=	4.01E-12	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	1.04E-08	x		=	NA	1.21E-07	/[		x	1000	]=	NA
Nitrite	2.81E-09	x		=	NA	3.28E-08	/[		x	1000	]=	NA
Silver	7.03E-11	x		=	NA	8.20E-10	/[		x	1000	]=	NA
Strontium	1.41E-07	x		=	NA	1.64E-06	/[		x	1000	]=	NA
Tin	4.05E-09	x		=	NA	4.73E-08	/[		x	1000	]=	NA
Total Uranium	7.32E-10	x		=	NA	8.54E-09	/[	4.00E-05	x	1000	]=	2.14E-07
Vanadium	6.11E-08	x		=	NA	7.13E-07	/[	1.00E-04	x	1000	]=	7.13E-06
Zinc	5.89E-08	x		=	NA	6.87E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.33E-09	x	2.40E-06	=	5.59E-15	2.72E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	8.76E-11	x	0.00E+00	=	0.00E+00	1.02E-09	/		x	1000	]=	NA
			Pathway total =		1.22E-09					Pathway total =		1.64E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.98E-07	x	1.50E+00	=	1.05E-06	8.14E-06	/	3.00E-04	=	2.71E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	3.33E-10	x		=	NA	3.89E-09	/	2.50E-05	=	1.55E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	6.10E-07	x	1.40E-02	=	8.54E-09	7.12E-06	/	2.00E-02	=	3.56E-04
Butylbenzylphthalate	2.29E-08	x	1.90E-03	=	4.36E-11	2.68E-07	/	2.00E-01	=	1.34E-06
			Pathway total =		**1.06E-06**			Pathway total =		2.76E-02

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**9.9E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	**6.9E-02**	4%
Arsenic	Sum of all pathways	=	1.40E-05	Sum of all pathways	=	**3.6E-01**	22%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02	1%
Beryllium	Sum of all pathways	=	8.86E-13	Sum of all pathways	=	2.1E-03	0%
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-03	0%
Cadmium	Sum of all pathways	=	2.29E-13	Sum of all pathways	=	1.6E-03	0%
Chromium	Sum of all pathways	=	1.10E-09	Sum of all pathways	=	**4.9E-02**	3%
Cobalt	Sum of all pathways	=	8.38E-11	Sum of all pathways	=	**3.5E-01**	21%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.9E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.4E-01**	27%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.5E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.5E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-10	0%
Nickel	Sum of all pathways	=	4.01E-12	Sum of all pathways	=	8.8E-03	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-04	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-03	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-05	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.4E-01**	8%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.2E-03	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	4.03E-08	Sum of all pathways	=	1.7E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.06E-10	Sum of all pathways	=	6.3E-06	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.41E-05**
Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.65E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	7.01E-03	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.95E-07	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	3.94E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	9.14E-05	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	1.80E-07	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.05E-07	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.06E-05	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	9.05E-06	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.33E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	1.39E-06	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.31E-02	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	7.75E-06	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	3.90E-04	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	1.87E-08	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	2.68E-06	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.44E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	8.42E-06	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	3.40E-06	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	1.48E-06	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	1.03E-07	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	3.40E-05	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	7.54E-07	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	6.48E-05	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	4.17E-05	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	5.06E-08	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
1-Butanol	2.43E-08	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.02E-06	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	6.49E-08	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Hexane	6.63E-08	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	2.48E-08	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	8.18E-02	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.44E-06	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	4.60E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.07E-03	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	2.10E-06	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.22E-06	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.24E-04	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.06E-04	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.56E-04	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	1.62E-05	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	2.69E-01	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	9.04E-05	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.55E-03	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	2.19E-07	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	3.13E-05	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.68E-04	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	9.82E-05	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	3.96E-05	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	1.73E-05	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	1.20E-06	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	3.96E-04	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	8.79E-06	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	7.56E-04	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	4.86E-04	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	5.91E-07	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
1-Butanol	2.84E-07	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	2.35E-05	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	7.57E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Hexane	7.74E-07	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	2.90E-07	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.20E-06	=	[	8.8E-05	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.03E-10	=	[	3.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.05E-09	=	[	4.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.40E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.85E-10	=	[	2.2E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.08E-10	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.09E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.30E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.37E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.42E-09	=	[	1.7E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.37E-05	=	[	2.9E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	7.96E-09	=	[	9.7E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.01E-07	=	[	4.9E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.93E-11	=	[	2.3E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.76E-09	=	[	3.4E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.48E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	8.65E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.49E-09	=	[	4.2E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.52E-09	=	[	1.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	1.06E-10	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.49E-08	=	[	4.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.74E-10	=	[	9.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.66E-08	=	[	8.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.28E-08	=	[	5.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	5.20E-11	=	[	6.3E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
1-Butanol	2.50E-11	=	[	3.0E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.07E-09	=	[	2.5E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.67E-11	=	[	8.1E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	6.81E-11	=	[	8.3E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.55E-11	=	[	3.1E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.40E-05	=	[	8.8E-05	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.54E-09	=	[	3.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.73E-08	=	[	4.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.10E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.15E-09	=	[	2.2E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.26E-09	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.27E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.08E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	1.66E-08	=	[	1.7E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	2.77E-04	=	[	2.9E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	9.29E-08	=	[	9.7E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.67E-06	=	[	4.9E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.25E-10	=	[	2.3E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.22E-08	=	[	3.4E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.72E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.01E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.07E-08	=	[	4.2E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.77E-08	=	[	1.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.23E-09	=	[	1.3E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.07E-07	=	[	4.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.03E-09	=	[	9.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.77E-07	=	[	8.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	4.99E-07	=	[	5.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	6.07E-10	=	[	6.3E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
1-Butanol	2.92E-10	=	[	3.0E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.42E-08	=	[	2.5E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	7.78E-10	=	[	8.1E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	7.95E-10	=	[	8.3E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	2.98E-10	=	[	3.1E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	3.18E-07	=	[	3.60E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	2.82E-10	=	[	9.56E-02	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
1-Butanol	6.54E-09	=	[	2.22E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.42E-07	=	[	1.84E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.75E-08	=	[	5.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	6.68E-09	=	[	2.27E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	3.71E-06	=	[	3.60E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	3.29E-09	=	[	9.56E-02	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
1-Butanol	7.64E-08	=	[	2.22E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	6.33E-06	=	[	1.84E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.04E-07	=	[	5.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	NA	=	[	2.27E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.01E-03	x	0.00E+00	=	0.00E+00	8.18E-02	/	1.00E+00	=	8.18E-02
Antimony	2.95E-07	x	0.00E+00	=	0.00E+00	3.44E-06	/	4.00E-04	=	8.61E-03
Arsenic	3.94E-06	x	1.50E+00	=	5.92E-06	4.60E-05	/	3.00E-04	=	1.53E-01
Barium	9.14E-05	x	0.00E+00	=	0.00E+00	1.07E-03	/	2.00E-01	=	5.33E-03
Beryllium	1.80E-07	x	0.00E+00	=	0.00E+00	2.10E-06	/	2.00E-03	=	1.05E-03
Cadmium	1.05E-07	x	0.00E+00	=	0.00E+00	1.22E-06	/	1.00E-03	=	1.22E-03
Chromium	1.06E-05	x	0.00E+00	=	0.00E+00	1.24E-04	/	3.00E-03	=	4.12E-02
Cobalt	9.05E-06	x	0.00E+00	=	0.00E+00	1.06E-04	/	3.00E-04	=	3.52E-01
Copper	1.33E-05	x	0.00E+00	=	0.00E+00	1.56E-04	/	4.00E-02	=	3.89E-03
Fluoride	1.39E-06	x	0.00E+00	=	0.00E+00	1.62E-05	/	4.00E-02	=	4.04E-04
Iron	2.31E-02	x	0.00E+00	=	0.00E+00	2.69E-01	/	7.00E-01	=	3.85E-01
Lithium	7.75E-06	x	0.00E+00	=	0.00E+00	9.04E-05	/	2.00E-03	=	4.52E-02
Manganese	3.90E-04	x	0.00E+00	=	0.00E+00	4.55E-03	/	1.40E-01	=	3.25E-02
Mercury	1.87E-08	x	0.00E+00	=	0.00E+00	2.19E-07	/	0.00E+00	=	NA
Molybdenum	2.68E-06	x	0.00E+00	=	0.00E+00	3.13E-05	/	5.00E-03	=	6.26E-03
Nickel	1.44E-05	x	0.00E+00	=	0.00E+00	1.68E-04	/	2.00E-02	=	8.39E-03
Nitrate	8.42E-06	x	0.00E+00	=	0.00E+00	9.82E-05	/	7.10E+00	=	1.38E-05
Nitrite	3.40E-06	x	0.00E+00	=	0.00E+00	3.96E-05	/	3.00E-01	=	1.32E-04
Selenium	1.48E-06	x	0.00E+00	=	0.00E+00	1.73E-05	/	5.00E-03	=	3.45E-03
Silver	1.03E-07	x	0.00E+00	=	0.00E+00	1.20E-06	/	5.00E-03	=	2.40E-04
Strontium	3.40E-05	x	0.00E+00	=	0.00E+00	3.96E-04	/	6.00E-01	=	6.61E-04
Total Uranium	7.54E-07	x	0.00E+00	=	0.00E+00	8.79E-06	/	3.00E-03	=	2.93E-03
Vanadium	6.48E-05	x	0.00E+00	=	0.00E+00	7.56E-04	/	5.00E-03	=	1.51E-01
Zinc	4.17E-05	x	0.00E+00	=	0.00E+00	4.86E-04	/	3.00E-01	=	1.62E-03
Acetone	5.06E-08	x	0.00E+00	=	0.00E+00	5.91E-07	/	9.00E-01	=	6.56E-07
1-Butanol	2.43E-08	x	0.00E+00	=	0.00E+00	2.84E-07	/	1.00E-01	=	2.84E-06
Bis(2-ethylhexyl) phthalate	2.02E-06	x	1.40E-02	=	2.82E-08	2.35E-05	/	2.00E-02	=	1.18E-03
Butylbenzylphthalate	6.49E-08	x	1.90E-03	=	1.23E-10	7.57E-07	/	2.00E-01	=	3.78E-06
Hexane	6.63E-08	x	0.00E+00	=	0.00E+00	7.74E-07	/	6.00E-02	=	1.29E-05
beta-BHC	2.48E-08	x	1.80E+00	=	4.47E-08	2.90E-07	/	0.00E+00	=	NA
			Pathway total	=	5.99E-06			Pathway total	=	1.29E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.20E-06	x		=	NA	8.40E-05	/[	5.00E-03	x	1000	]=	1.68E-05
Antimony	3.03E-10	x		=	NA	3.54E-09	/[		x	1000	]=	NA
Arsenic	4.05E-09	x	4.30E-03	=	1.74E-11	4.73E-08	/[	1.50E-05	x	1000	]=	3.15E-06
Barium	9.40E-08	x		=	NA	1.10E-06	/[	5.00E-04	x	1000	]=	2.19E-06
Beryllium	1.85E-10	x	2.40E-03	=	4.43E-13	2.15E-09	/[	2.00E-05	x	1000	]=	1.08E-07
Cadmium	1.08E-10	x	1.80E-03	=	1.94E-13	1.26E-09	/[	1.00E-05	x	1000	]=	1.26E-07
Chromium	1.09E-08	x	8.40E-02	=	9.15E-10	1.27E-07	/[	1.00E-04	x	1000	]=	1.27E-06
Cobalt	9.30E-09	x	9.00E-03	=	8.37E-11	1.08E-07	/[	6.00E-06	x	1000	]=	1.81E-05
Copper	1.37E-08	x		=	NA	1.60E-07	/[		x	1000	]=	NA
Fluoride	1.42E-09	x		=	NA	1.66E-08	/[	1.30E-02	x	1000	]=	1.28E-09
Iron	2.37E-05	x		=	NA	2.77E-04	/[		x	1000	]=	NA
Lithium	7.96E-09	x		=	NA	9.29E-08	/[		x	1000	]=	NA
Manganese	4.01E-07	x		=	NA	4.67E-06	/[	5.00E-05	x	1000	]=	9.35E-05
Mercury	1.93E-11	x	0.00E+00	=	0.00E+00	2.25E-10	/[	3.00E-04	x	1000	]=	7.49E-10
Molybdenum	2.76E-09	x	0.00E+00	=	0.00E+00	3.22E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.48E-08	x	2.60E-04	=	3.84E-12	1.72E-07	/[	9.00E-05	x	1000	]=	1.92E-06
Nitrate	8.65E-09	x		=	NA	1.01E-07	/[		x	1000	]=	NA
Nitrite	3.49E-09	x		=	NA	4.07E-08	/[		x	1000	]=	NA
Selenium	1.52E-09	x	0.00E+00	=	0.00E+00	1.77E-08	/[	2.00E-02	x	1000	]=	8.87E-10
Silver	1.06E-10	x		=	NA	1.23E-09	/[		x	1000	]=	NA
Strontium	3.49E-08	x		=	NA	4.07E-07	/[		x	1000	]=	NA
Total Uranium	7.74E-10	x		=	NA	9.03E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	6.66E-08	x		=	NA	7.77E-07	/[	1.00E-04	x	1000	]=	7.77E-06
Zinc	4.28E-08	x		=	NA	4.99E-07	/[		x	1000	]=	NA
Acetone	5.20E-11	x	0.00E+00	=	0.00E+00	6.07E-10	/[	3.10E+01	x	1000	]=	1.96E-14
1-Butanol	2.50E-11	x	0.00E+00	=	0.00E+00	2.92E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.07E-09	x	2.40E-06	=	4.97E-15	2.42E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.67E-11	x	0.00E+00	=	0.00E+00	7.78E-10	/[		x	1000	]=	NA
Hexane	6.81E-11	x	0.00E+00	=	0.00E+00	7.95E-10	/[	7.00E-01	x	1000	]=	1.14E-12
beta-BHC	2.55E-11	x	5.30E-04	=	1.35E-14	2.98E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.02E-09					Pathway total =		1.45E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.18E-07	x	1.50E+00	=	4.77E-07	3.71E-06	/	3.00E-04	=	1.24E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.82E-10	x		=	NA	3.29E-09	/	2.50E-05	=	1.32E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	6.54E-09	x		=	NA	7.64E-08	/	1.00E-01	=	7.64E-07
Bis(2-ethylhexyl) phthalate	5.42E-07	x	1.40E-02	=	7.59E-09	6.33E-06	/	2.00E-02	=	3.16E-04
Butylbenzylphthalate	1.75E-08	x	1.90E-03	=	3.32E-11	2.04E-07	/	2.00E-01	=	1.02E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	6.68E-09	x	1.80E+00	=	1.20E-08	NA	/		=	NA
			Pathway total =		**4.97E-07**			Pathway total =		1.28E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**8.2E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-03	1%
Arsenic	Sum of all pathways	=	6.39E-06	Sum of all pathways	=	**1.7E-01**	13%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-03	0%
Beryllium	Sum of all pathways	=	4.43E-13	Sum of all pathways	=	1.0E-03	0%
Cadmium	Sum of all pathways	=	1.94E-13	Sum of all pathways	=	1.4E-03	0%
Chromium	Sum of all pathways	=	9.15E-10	Sum of all pathways	=	**4.1E-02**	3%
Cobalt	Sum of all pathways	=	8.37E-11	Sum of all pathways	=	**3.5E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**3.8E-01**	30%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**4.5E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.3E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-10	0%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-03	0%
Nickel	Sum of all pathways	=	3.84E-12	Sum of all pathways	=	8.4E-03	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-04	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	3.5E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.5E-01**	12%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	6.6E-07	0%
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	3.6E-06	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	3.58E-08	Sum of all pathways	=	1.5E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.56E-10	Sum of all pathways	=	4.8E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05	0%
beta-BHC	Sum of all pathways	=	5.67E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	6.49E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.30E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	7.81E-03	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.58E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	5.55E-06	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	8.93E-05	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	3.03E-07	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.32E-07	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.36E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	1.00E-05	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.40E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	3.15E-06	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.77E-02	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	9.17E-06	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	3.99E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	2.10E-08	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.22E-05	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	1.25E-05	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	5.05E-06	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	1.94E-07	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	3.63E-05	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Tin	1.58E-05	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.72E-06	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	8.52E-05	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	2.01E-04	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	1.07E-08	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.52E-06	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	9.46E-07	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	1.47E-09	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	3.22E-10	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	2.83E-08	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	2.94E-08	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	9.11E-02	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.01E-06	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	6.47E-05	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.04E-03	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	3.53E-06	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.54E-06	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.59E-04	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.17E-04	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.63E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	3.67E-05	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.24E-01	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.07E-04	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.66E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	2.45E-07	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.42E-04	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	1.46E-04	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	5.89E-05	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	2.27E-06	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.24E-04	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Tin	1.84E-04	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	2.01E-05	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	9.94E-04	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	2.35E-03	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	1.25E-07	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	2.94E-05	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	1.10E-05	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	1.71E-08	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	3.76E-09	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	3.30E-07	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	3.43E-07	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.03E-06	=	[	9.8E-05	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.65E-10	=	[	3.2E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.70E-09	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.18E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.11E-10	=	[	3.8E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.36E-10	=	[	1.7E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.40E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.44E-08	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	3.23E-09	=	[	3.9E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.85E-05	=	[	3.5E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.42E-09	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.10E-07	=	[	5.0E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.16E-11	=	[	2.6E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.25E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.29E-08	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	5.19E-09	=	[	6.3E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	2.00E-10	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.73E-08	=	[	4.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.62E-08	=	[	2.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	1.77E-09	=	[	2.1E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	8.75E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	2.07E-07	=	[	2.5E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	1.10E-11	=	[	1.3E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.59E-09	=	[	3.2E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	9.72E-10	=	[	1.2E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.51E-12	=	[	1.8E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.31E-13	=	[	4.0E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.90E-11	=	[	3.5E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.02E-11	=	[	3.7E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.36E-05	=	[	9.8E-05	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.09E-09	=	[	3.2E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.65E-08	=	[	6.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.07E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.63E-09	=	[	3.8E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.59E-09	=	[	1.7E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.63E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.20E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.68E-07	=	[	1.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.77E-08	=	[	3.9E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.32E-04	=	[	3.5E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.10E-07	=	[	1.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.79E-06	=	[	5.0E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.52E-10	=	[	2.6E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.46E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.50E-07	=	[	1.6E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	6.05E-08	=	[	6.3E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	2.33E-09	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.35E-07	=	[	4.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.89E-07	=	[	2.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	2.06E-08	=	[	2.1E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.02E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	2.41E-06	=	[	2.5E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	1.29E-10	=	[	1.3E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	3.02E-08	=	[	3.2E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	1.13E-08	=	[	1.2E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.76E-11	=	[	1.8E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	3.86E-12	=	[	4.0E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.39E-10	=	[	3.5E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	3.52E-10	=	[	3.7E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	4.48E-07	=	[	5.06E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	3.56E-10	=	[	1.21E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.78E-07	=	[	2.30E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	2.54E-07	=	[	8.63E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
beta-BHC	7.61E-09	=	[	2.58E-02	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	1.11E-08	=	[	2.68E-02	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	5.22E-06	=	[	5.06E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	4.15E-09	=	[	1.21E-01	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	7.91E-06	=	[	2.30E+00	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	2.97E-06	=	[	8.63E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
beta-BHC	NA	=	[	2.58E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	1.29E-07	=	[	2.68E-02	x	1.00E-06	x	2,690	x	0.2	x	0.14	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.81E-03	x	0.00E+00	=	0.00E+00	9.11E-02	/	1.00E+00	=	9.11E-02
Antimony	2.58E-07	x	0.00E+00	=	0.00E+00	3.01E-06	/	4.00E-04	=	7.52E-03
Arsenic	5.55E-06	x	1.50E+00	=	8.32E-06	6.47E-05	/	3.00E-04	=	2.16E-01
Barium	8.93E-05	x	0.00E+00	=	0.00E+00	1.04E-03	/	2.00E-01	=	5.21E-03
Beryllium	3.03E-07	x	0.00E+00	=	0.00E+00	3.53E-06	/	2.00E-03	=	1.77E-03
Cadmium	1.32E-07	x	0.00E+00	=	0.00E+00	1.54E-06	/	1.00E-03	=	1.54E-03
Chromium	1.36E-05	x	0.00E+00	=	0.00E+00	1.59E-04	/	3.00E-03	=	5.29E-02
Cobalt	1.00E-05	x	0.00E+00	=	0.00E+00	1.17E-04	/	3.00E-04	=	3.90E-01
Copper	1.40E-05	x	0.00E+00	=	0.00E+00	1.63E-04	/	4.00E-02	=	4.08E-03
Fluoride	3.15E-06	x	0.00E+00	=	0.00E+00	3.67E-05	/	4.00E-02	=	9.18E-04
Iron	2.77E-02	x	0.00E+00	=	0.00E+00	3.24E-01	/	7.00E-01	=	4.62E-01
Lithium	9.17E-06	x	0.00E+00	=	0.00E+00	1.07E-04	/	2.00E-03	=	5.35E-02
Manganese	3.99E-04	x	0.00E+00	=	0.00E+00	4.66E-03	/	1.40E-01	=	3.33E-02
Mercury	2.10E-08	x	0.00E+00	=	0.00E+00	2.45E-07	/	0.00E+00	=	NA
Nickel	1.22E-05	x	0.00E+00	=	0.00E+00	1.42E-04	/	2.00E-02	=	7.10E-03
Nitrate	1.25E-05	x	0.00E+00	=	0.00E+00	1.46E-04	/	7.10E+00	=	2.06E-05
Nitrite	5.05E-06	x	0.00E+00	=	0.00E+00	5.89E-05	/	3.00E-01	=	1.96E-04
Silver	1.94E-07	x	0.00E+00	=	0.00E+00	2.27E-06	/	5.00E-03	=	4.54E-04
Strontium	3.63E-05	x	0.00E+00	=	0.00E+00	4.24E-04	/	6.00E-01	=	7.06E-04
Tin	1.58E-05	x	0.00E+00	=	0.00E+00	1.84E-04	/	6.00E-01	=	3.07E-04
Total Uranium	1.72E-06	x	0.00E+00	=	0.00E+00	2.01E-05	/	3.00E-03	=	6.68E-03
Vanadium	8.52E-05	x	0.00E+00	=	0.00E+00	9.94E-04	/	5.00E-03	=	1.99E-01
Zinc	2.01E-04	x	0.00E+00	=	0.00E+00	2.35E-03	/	3.00E-01	=	7.82E-03
Acetone	1.07E-08	x	0.00E+00	=	0.00E+00	1.25E-07	/	9.00E-01	=	1.39E-07
Bis(2-ethylhexyl) phthalate	2.52E-06	x	1.40E-02	=	3.53E-08	2.94E-05	/	2.00E-02	=	1.47E-03
Di-n-butylphthalate	9.46E-07	x	0.00E+00	=	0.00E+00	1.10E-05	/	1.00E-01	=	1.10E-04
Methylene chloride	1.47E-09	x	2.00E-03	=	2.94E-12	1.71E-08	/	6.00E-03	=	2.86E-06
Toluene	3.22E-10	x	0.00E+00	=	0.00E+00	3.76E-09	/	8.00E-02	=	4.70E-08
beta-BHC	2.83E-08	x	1.80E+00	=	5.09E-08	3.30E-07	/	0.00E+00	=	NA
Aroclor-1260	2.94E-08	x	2.00E+00	=	5.87E-08	3.43E-07	/	0.00E+00	=	NA
			Pathway total	=	8.47E-06			Pathway total	=	1.54E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.03E-06	x		=	NA	9.36E-05	/[	5.00E-03	x	1000	]=	1.87E-05
Antimony	2.65E-10	x		=	NA	3.09E-09	/[		x	1000	]=	NA
Arsenic	5.70E-09	x	4.30E-03	=	2.45E-11	6.65E-08	/[	1.50E-05	x	1000	]=	4.43E-06
Barium	9.18E-08	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.14E-06
Beryllium	3.11E-10	x	2.40E-03	=	7.46E-13	3.63E-09	/[	2.00E-05	x	1000	]=	1.81E-07
Cadmium	1.36E-10	x	1.80E-03	=	2.45E-13	1.59E-09	/[	1.00E-05	x	1000	]=	1.59E-07
Chromium	1.40E-08	x	8.40E-02	=	1.17E-09	1.63E-07	/[	1.00E-04	x	1000	]=	1.63E-06
Cobalt	1.03E-08	x	9.00E-03	=	9.28E-11	1.20E-07	/[	6.00E-06	x	1000	]=	2.00E-05
Copper	1.44E-08	x		=	NA	1.68E-07	/[		x	1000	]=	NA
Fluoride	3.23E-09	x		=	NA	3.77E-08	/[	1.30E-02	x	1000	]=	2.90E-09
Iron	2.85E-05	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	9.42E-09	x		=	NA	1.10E-07	/[		x	1000	]=	NA
Manganese	4.10E-07	x		=	NA	4.79E-06	/[	5.00E-05	x	1000	]=	9.57E-05
Mercury	2.16E-11	x	0.00E+00	=	0.00E+00	2.52E-10	/[	3.00E-04	x	1000	]=	8.41E-10
Nickel	1.25E-08	x	2.60E-04	=	3.25E-12	1.46E-07	/[	9.00E-05	x	1000	]=	1.62E-06
Nitrate	1.29E-08	x		=	NA	1.50E-07	/[		x	1000	]=	NA
Nitrite	5.19E-09	x		=	NA	6.05E-08	/[		x	1000	]=	NA
Silver	2.00E-10	x		=	NA	2.33E-09	/[		x	1000	]=	NA
Strontium	3.73E-08	x		=	NA	4.35E-07	/[		x	1000	]=	NA
Tin	1.62E-08	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Total Uranium	1.77E-09	x		=	NA	2.06E-08	/[	4.00E-05	x	1000	]=	5.15E-07
Vanadium	8.75E-08	x		=	NA	1.02E-06	/[	1.00E-04	x	1000	]=	1.02E-05
Zinc	2.07E-07	x		=	NA	2.41E-06	/[		x	1000	]=	NA
Acetone	1.10E-11	x	0.00E+00	=	0.00E+00	1.29E-10	/[	3.10E+01	x	1000	]=	4.15E-15
Bis(2-ethylhexyl) phthalate	2.59E-09	x	2.40E-06	=	6.22E-15	3.02E-08	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	9.72E-10	x	0.00E+00	=	0.00E+00	1.13E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.51E-12	x	1.00E-08	=	1.51E-20	1.76E-11	/[	6.00E-01	x	1000	]=	2.93E-14
Toluene	3.31E-13	x	0.00E+00	=	0.00E+00	3.86E-12	/[	5.00E+00	x	1000	]=	7.72E-16
beta-BHC	2.90E-11	x	5.30E-04	=	1.54E-14	3.39E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.02E-11	x	5.70E-04	=	1.72E-14	3.52E-10	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.29E-09					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.48E-07	x	1.50E+00	=	6.72E-07	5.22E-06	/	3.00E-04	=	1.74E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.56E-10	x		=	NA	4.15E-09	/	2.50E-05	=	1.66E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	6.78E-07	x	1.40E-02	=	9.49E-09	7.91E-06	/	2.00E-02	=	3.96E-04
Di-n-butylphthalate	2.54E-07	x		=	NA	2.97E-06	/	1.00E-01	=	2.97E-05
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	7.61E-09	x	1.80E+00	=	1.37E-08	NA	/		=	NA
Aroclor-1260	1.11E-08	x	2.00E+00	=	2.21E-08	1.29E-07	/		=	NA
			Pathway total =		7.17E-07			Pathway total =		1.80E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**9.1E-02**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.5E-03	0%
Arsenic	Sum of all pathways	=	9.00E-06	Sum of all pathways	=	**2.3E-01**	15%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-03	0%
Beryllium	Sum of all pathways	=	7.46E-13	Sum of all pathways	=	1.8E-03	0%
Cadmium	Sum of all pathways	=	2.45E-13	Sum of all pathways	=	1.7E-03	0%
Chromium	Sum of all pathways	=	1.17E-09	Sum of all pathways	=	**5.3E-02**	3%
Cobalt	Sum of all pathways	=	9.28E-11	Sum of all pathways	=	**3.9E-01**	25%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	9.2E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.6E-01**	30%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.3E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.3E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-10	0%
Nickel	Sum of all pathways	=	3.25E-12	Sum of all pathways	=	7.1E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.0E-04	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.5E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-04	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**2.0E-01**	13%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-03	1%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	4.48E-08	Sum of all pathways	=	1.9E-03	0%
Di-n-butylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-04	0%
Methylene chloride	Sum of all pathways	=	2.94E-12	Sum of all pathways	=	2.9E-06	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-08	0%
beta-BHC	Sum of all pathways	=	6.46E-08	Sum of all pathways	=	**NA**	
Aroclor-1260	Sum of all pathways	=	8.09E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	9.19E-06	All Pathways and Chemicals	=	**1.56E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	9.19E-03	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	2.68E-07	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	6.39E-06	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	8.68E-05	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	1.92E-07	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	3.80E-06	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.23E-05	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	1.15E-05	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.62E-05	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	3.87E-06	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.84E-02	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	9.92E-06	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	4.48E-04	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	1.48E-08	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.21E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	4.35E-05	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	5.82E-06	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	7.68E-07	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Silver	7.61E-08	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	4.09E-05	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	7.23E-07	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	7.04E-05	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	5.33E-05	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	7.01E-09	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.17E-07	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
2-Hexanone	3.04E-09	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	1.53E-09	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	6.49E-10	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.07E-01	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.13E-06	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	7.45E-05	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.01E-03	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	2.24E-06	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	4.44E-05	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.43E-04	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.34E-04	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.89E-04	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	4.51E-05	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	3.31E-01	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.16E-04	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	5.23E-03	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	1.73E-07	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.41E-04	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	5.08E-04	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	6.79E-05	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	8.96E-06	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Silver	8.87E-07	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	4.77E-04	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	8.44E-06	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	8.21E-04	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	6.21E-04	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	8.18E-08	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	1.37E-06	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
2-Hexanone	3.54E-08	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	1.79E-08	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	7.57E-09	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.45E-06	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.76E-10	=	[	3.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	6.56E-09	=	[	8.0E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	8.92E-08	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.97E-10	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	3.91E-09	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.26E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.18E-08	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.67E-08	=	[	2.0E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	3.97E-09	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.92E-05	=	[	3.5E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.02E-08	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.60E-07	=	[	5.6E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.52E-11	=	[	1.8E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.24E-08	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	4.47E-08	=	[	5.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	5.98E-09	=	[	7.3E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	7.89E-10	=	[	9.6E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.81E-11	=	[	9.5E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.20E-08	=	[	5.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.43E-10	=	[	9.0E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.23E-08	=	[	8.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.47E-08	=	[	6.7E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.21E-12	=	[	8.8E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.20E-10	=	[	1.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Hexanone	3.12E-12	=	[	3.8E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.58E-12	=	[	1.9E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	6.67E-13	=	[	8.1E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation Units	EC ug/m^3	=	[	CA ug/m^3	x	EF days/year	x	ET hrs/day	x	ED years	]	/	[(	AT days	x	CF2 hrs/day	)]
NONCARCINOGENIC EFFECTS																	
Aluminum	1.10E-04	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.22E-09	=	[	3.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	7.66E-08	=	[	8.0E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.04E-06	=	[	1.1E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.30E-09	=	[	2.4E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.56E-08	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.47E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.38E-07	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.94E-07	=	[	2.0E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	4.64E-08	=	[	4.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.40E-04	=	[	3.5E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.19E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.37E-06	=	[	5.6E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	1.77E-10	=	[	1.8E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.44E-07	=	[	1.5E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	5.21E-07	=	[	5.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	6.98E-08	=	[	7.3E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	9.21E-09	=	[	9.6E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	9.12E-10	=	[	9.5E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.90E-07	=	[	5.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.67E-09	=	[	9.0E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.43E-07	=	[	8.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.38E-07	=	[	6.7E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.41E-11	=	[	8.8E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.41E-09	=	[	1.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Hexanone	3.64E-11	=	[	3.8E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.84E-11	=	[	1.9E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	7.78E-12	=	[	8.1E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	5.16E-07	=	[	5.83E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cadmium	1.02E-08	=	[	3.47E+00	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	3.15E-08	=	[	1.07E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	6.02E-06	=	[	5.83E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cadmium	1.19E-07	=	[	3.47E+00	x	1.00E-06	x	2,690	x	0.2	x	0.001	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	3.68E-07	=	[	1.07E-01	x	1.00E-06	x	2,690	x	0.2	x	0.1	x	1	x	350	x	6	]	/	[	15	x	2,190	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	9.19E-03	x	0.00E+00	=	0.00E+00	1.07E-01	/	1.00E+00	=	1.07E-01
Antimony	2.68E-07	x	0.00E+00	=	0.00E+00	3.13E-06	/	4.00E-04	=	7.83E-03
Arsenic	6.39E-06	x	1.50E+00	=	9.58E-06	7.45E-05	/	3.00E-04	=	2.48E-01
Barium	8.68E-05	x	0.00E+00	=	0.00E+00	1.01E-03	/	2.00E-01	=	5.06E-03
Beryllium	1.92E-07	x	0.00E+00	=	0.00E+00	2.24E-06	/	2.00E-03	=	1.12E-03
Cadmium	3.80E-06	x	0.00E+00	=	0.00E+00	4.44E-05	/	1.00E-03	=	4.44E-02
Chromium	1.23E-05	x	0.00E+00	=	0.00E+00	1.43E-04	/	3.00E-03	=	4.77E-02
Cobalt	1.15E-05	x	0.00E+00	=	0.00E+00	1.34E-04	/	3.00E-04	=	4.47E-01
Copper	1.62E-05	x	0.00E+00	=	0.00E+00	1.89E-04	/	4.00E-02	=	4.73E-03
Fluoride	3.87E-06	x	0.00E+00	=	0.00E+00	4.51E-05	/	4.00E-02	=	1.13E-03
Iron	2.84E-02	x	0.00E+00	=	0.00E+00	3.31E-01	/	7.00E-01	=	4.73E-01
Lithium	9.92E-06	x	0.00E+00	=	0.00E+00	1.16E-04	/	2.00E-03	=	5.79E-02
Manganese	4.48E-04	x	0.00E+00	=	0.00E+00	5.23E-03	/	1.40E-01	=	3.74E-02
Mercury	1.48E-08	x	0.00E+00	=	0.00E+00	1.73E-07	/	0.00E+00	=	NA
Nickel	1.21E-05	x	0.00E+00	=	0.00E+00	1.41E-04	/	2.00E-02	=	7.03E-03
Nitrate	4.35E-05	x	0.00E+00	=	0.00E+00	5.08E-04	/	7.10E+00	=	7.15E-05
Nitrite	5.82E-06	x	0.00E+00	=	0.00E+00	6.79E-05	/	3.00E-01	=	2.26E-04
Selenium	7.68E-07	x	0.00E+00	=	0.00E+00	8.96E-06	/	5.00E-03	=	1.79E-03
Silver	7.61E-08	x	0.00E+00	=	0.00E+00	8.87E-07	/	5.00E-03	=	1.77E-04
Strontium	4.09E-05	x	0.00E+00	=	0.00E+00	4.77E-04	/	6.00E-01	=	7.95E-04
Total Uranium	7.23E-07	x	0.00E+00	=	0.00E+00	8.44E-06	/	3.00E-03	=	2.81E-03
Vanadium	7.04E-05	x	0.00E+00	=	0.00E+00	8.21E-04	/	5.00E-03	=	1.64E-01
Zinc	5.33E-05	x	0.00E+00	=	0.00E+00	6.21E-04	/	3.00E-01	=	2.07E-03
Acetone	7.01E-09	x	0.00E+00	=	0.00E+00	8.18E-08	/	9.00E-01	=	9.09E-08
Butylbenzylphthalate	1.17E-07	x	1.90E-03	=	2.23E-10	1.37E-06	/	2.00E-01	=	6.84E-06
2-Hexanone	3.04E-09	x	0.00E+00	=	0.00E+00	3.54E-08	/	5.00E-03	=	7.08E-06
Methylene chloride	1.53E-09	x	2.00E-03	=	3.07E-12	1.79E-08	/	6.00E-03	=	2.98E-06
Toluene	6.49E-10	x	0.00E+00	=	0.00E+00	7.57E-09	/	8.00E-02	=	9.46E-08
			Pathway total	=	9.58E-06			Pathway total	=	1.66E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.45E-06	x		=	NA	1.10E-04	/[	5.00E-03	x	1000	]=	2.20E-05
Antimony	2.76E-10	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	6.56E-09	x	4.30E-03	=	2.82E-11	7.66E-08	/[	1.50E-05	x	1000	]=	5.11E-06
Barium	8.92E-08	x		=	NA	1.04E-06	/[	5.00E-04	x	1000	]=	2.08E-06
Beryllium	1.97E-10	x	2.40E-03	=	4.73E-13	2.30E-09	/[	2.00E-05	x	1000	]=	1.15E-07
Cadmium	3.91E-09	x	1.80E-03	=	7.03E-12	4.56E-08	/[	1.00E-05	x	1000	]=	4.56E-06
Chromium	1.26E-08	x	8.40E-02	=	1.06E-09	1.47E-07	/[	1.00E-04	x	1000	]=	1.47E-06
Cobalt	1.18E-08	x	9.00E-03	=	1.06E-10	1.38E-07	/[	6.00E-06	x	1000	]=	2.30E-05
Copper	1.67E-08	x		=	NA	1.94E-07	/[		x	1000	]=	NA
Fluoride	3.97E-09	x		=	NA	4.64E-08	/[	1.30E-02	x	1000	]=	3.57E-09
Iron	2.92E-05	x		=	NA	3.40E-04	/[		x	1000	]=	NA
Lithium	1.02E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	4.60E-07	x		=	NA	5.37E-06	/[	5.00E-05	x	1000	]=	1.07E-04
Mercury	1.52E-11	x	0.00E+00	=	0.00E+00	1.77E-10	/[	3.00E-04	x	1000	]=	5.91E-10
Nickel	1.24E-08	x	2.60E-04	=	3.22E-12	1.44E-07	/[	9.00E-05	x	1000	]=	1.61E-06
Nitrate	4.47E-08	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Nitrite	5.98E-09	x		=	NA	6.98E-08	/[		x	1000	]=	NA
Selenium	7.89E-10	x	0.00E+00	=	0.00E+00	9.21E-09	/[	2.00E-02	x	1000	]=	4.60E-10
Silver	7.81E-11	x		=	NA	9.12E-10	/[		x	1000	]=	NA
Strontium	4.20E-08	x		=	NA	4.90E-07	/[		x	1000	]=	NA
Total Uranium	7.43E-10	x		=	NA	8.67E-09	/[	4.00E-05	x	1000	]=	2.17E-07
Vanadium	7.23E-08	x		=	NA	8.43E-07	/[	1.00E-04	x	1000	]=	8.43E-06
Zinc	5.47E-08	x		=	NA	6.38E-07	/[		x	1000	]=	NA
Acetone	7.21E-12	x	0.00E+00	=	0.00E+00	8.41E-11	/[	3.10E+01	x	1000	]=	2.71E-15
Butylbenzylphthalate	1.20E-10	x	0.00E+00	=	0.00E+00	1.41E-09	/[		x	1000	]=	NA
2-Hexanone	3.12E-12	x	0.00E+00	=	0.00E+00	3.64E-11	/[	3.00E-02	x	1000	]=	1.21E-12
Methylene chloride	1.58E-12	x	1.00E-08	=	1.58E-20	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	6.67E-13	x	0.00E+00	=	0.00E+00	7.78E-12	/	5.00E+00	x	1000	]=	1.56E-15
			Pathway total =		1.20E-09					Pathway total =		1.76E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.16E-07	x	1.50E+00	=	7.73E-07	6.02E-06	/	3.00E-04	=	2.01E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.02E-08	x		=	NA	1.19E-07	/	2.50E-05	=	4.77E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.15E-08	x	1.90E-03	=	5.99E-11	3.68E-07	/	2.00E-01	=	1.84E-06
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		7.73E-07			Pathway total =		2.48E-02

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.1E-01**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-03	0%
Arsenic	Sum of all pathways	=	1.04E-05	Sum of all pathways	=	**2.7E-01**	16%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03	0%
Beryllium	Sum of all pathways	=	4.73E-13	Sum of all pathways	=	1.1E-03	0%
Cadmium	Sum of all pathways	=	7.03E-12	Sum of all pathways	=	**4.9E-02**	3%
Chromium	Sum of all pathways	=	1.06E-09	Sum of all pathways	=	**4.8E-02**	3%
Cobalt	Sum of all pathways	=	1.06E-10	Sum of all pathways	=	**4.5E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.7E-01**	28%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.8E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.7E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	5.9E-10	0%
Nickel	Sum of all pathways	=	3.22E-12	Sum of all pathways	=	7.0E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.3E-04	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.6E-01**	10%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-08	0%
Butylbenzylphthalate	Sum of all pathways	=	2.83E-10	Sum of all pathways	=	8.7E-06	0%
2-Hexanone	Sum of all pathways	=	NA	Sum of all pathways	=	7.1E-06	0%
Methylene chloride	Sum of all pathways	=	3.07E-12	Sum of all pathways	=	3.0E-06	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	9.5E-08	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.04E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.69E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	9.06E-03	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	3.19E-07	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	7.67E-06	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Barium	1.06E-04	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	2.58E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Boron	7.04E-06	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	1.10E-05	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	9.57E-06	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Copper	1.45E-05	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	2.21E-06	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Iron	2.53E-02	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	1.01E-05	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	3.99E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	2.26E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	2.77E-06	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	1.07E-05	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	9.33E-06	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	2.40E-06	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	2.19E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	5.44E-05	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	6.77E-07	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	5.69E-05	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	4.96E-05	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	6.77E-09	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Benzene	3.59E-10	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	4.13E-10	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	8.09E-10	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	1.06E-01	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	3.72E-06	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	8.95E-05	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Barium	1.24E-03	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	3.00E-06	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Boron	8.21E-05	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	1.28E-04	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	1.12E-04	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Copper	1.69E-04	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	2.58E-05	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Iron	2.95E-01	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	1.18E-04	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	4.65E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	2.63E-07	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	3.23E-05	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	1.25E-04	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	1.09E-04	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	2.80E-05	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	2.56E-05	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	6.34E-04	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	7.90E-06	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	6.64E-04	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	5.79E-04	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	7.90E-08	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Benzene	4.19E-09	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	4.82E-09	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	9.44E-09	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	350	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.31E-06	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.28E-10	=	[	4.0E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	7.88E-09	=	[	9.6E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.09E-07	=	[	1.3E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.65E-10	=	[	3.2E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	7.23E-09	=	[	8.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.13E-08	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.83E-09	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.49E-08	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.27E-09	=	[	2.8E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.60E-05	=	[	3.2E-04	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.04E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.10E-07	=	[	5.0E-06	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.32E-11	=	[	2.8E-10	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.85E-09	=	[	3.5E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.10E-08	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	9.58E-09	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.47E-09	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	2.25E-09	=	[	2.7E-08	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.58E-08	=	[	6.8E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.95E-10	=	[	8.5E-09	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	5.84E-08	=	[	7.1E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.10E-08	=	[	6.2E-07	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	6.96E-12	=	[	8.5E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Benzene	3.69E-13	=	[	4.5E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.24E-13	=	[	5.2E-12	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	8.31E-13	=	[	1.0E-11	x	350	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.09E-04	=	[	1.1E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.82E-09	=	[	4.0E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	9.19E-08	=	[	9.6E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.27E-06	=	[	1.3E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.09E-09	=	[	3.2E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	8.43E-08	=	[	8.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.31E-07	=	[	1.4E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.15E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.73E-07	=	[	1.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.65E-08	=	[	2.8E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.03E-04	=	[	3.2E-04	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.21E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.78E-06	=	[	5.0E-06	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.71E-10	=	[	2.8E-10	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.32E-08	=	[	3.5E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.29E-07	=	[	1.3E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.12E-07	=	[	1.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	2.88E-08	=	[	3.0E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	2.63E-08	=	[	2.7E-08	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	6.52E-07	=	[	6.8E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.11E-09	=	[	8.5E-09	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	6.82E-07	=	[	7.1E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.95E-07	=	[	6.2E-07	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.12E-11	=	[	8.5E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Benzene	4.31E-12	=	[	4.5E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	4.95E-12	=	[	5.2E-12	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	9.69E-12	=	[	1.0E-11	x	350	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Arsenic	6.19E-07	=	[	7.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,690	x	0.2	x	0	x	1	x	350	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Arsenic	7.22E-06	=	[	7.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0.03	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,690	x	0.2	x		x	1	x	350	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,690	x	0.2	x	0.00	x	1	x	350	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	9.06E-03	x	0.00E+00	=	0.00E+00	1.06E-01	/	1.00E+00	=	1.06E-01
Antimony	3.19E-07	x	0.00E+00	=	0.00E+00	3.72E-06	/	4.00E-04	=	9.30E-03
Arsenic	7.67E-06	x	1.50E+00	=	1.15E-05	8.95E-05	/	3.00E-04	=	2.98E-01
Barium	1.06E-04	x	0.00E+00	=	0.00E+00	1.24E-03	/	2.00E-01	=	6.19E-03
Beryllium	2.58E-07	x	0.00E+00	=	0.00E+00	3.00E-06	/	2.00E-03	=	1.50E-03
Boron	7.04E-06	x	0.00E+00	=	0.00E+00	8.21E-05	/	2.00E-01	=	4.10E-04
Chromium	1.10E-05	x	0.00E+00	=	0.00E+00	1.28E-04	/	3.00E-03	=	4.26E-02
Cobalt	9.57E-06	x	0.00E+00	=	0.00E+00	1.12E-04	/	3.00E-04	=	3.72E-01
Copper	1.45E-05	x	0.00E+00	=	0.00E+00	1.69E-04	/	4.00E-02	=	4.22E-03
Fluoride	2.21E-06	x	0.00E+00	=	0.00E+00	2.58E-05	/	4.00E-02	=	6.46E-04
Iron	2.53E-02	x	0.00E+00	=	0.00E+00	2.95E-01	/	7.00E-01	=	4.22E-01
Lithium	1.01E-05	x	0.00E+00	=	0.00E+00	1.18E-04	/	2.00E-03	=	5.91E-02
Manganese	3.99E-04	x	0.00E+00	=	0.00E+00	4.65E-03	/	1.40E-01	=	3.32E-02
Mercury	2.26E-08	x	0.00E+00	=	0.00E+00	2.63E-07	/	0.00E+00	=	NA
Molybdenum	2.77E-06	x	0.00E+00	=	0.00E+00	3.23E-05	/	5.00E-03	=	6.47E-03
Nickel	1.07E-05	x	0.00E+00	=	0.00E+00	1.25E-04	/	2.00E-02	=	6.26E-03
Nitrate	9.33E-06	x	0.00E+00	=	0.00E+00	1.09E-04	/	7.10E+00	=	1.53E-05
Nitrite	2.40E-06	x	0.00E+00	=	0.00E+00	2.80E-05	/	3.00E-01	=	9.33E-05
Selenium	2.19E-06	x	0.00E+00	=	0.00E+00	2.56E-05	/	5.00E-03	=	5.11E-03
Strontium	5.44E-05	x	0.00E+00	=	0.00E+00	6.34E-04	/	6.00E-01	=	1.06E-03
Total Uranium	6.77E-07	x	0.00E+00	=	0.00E+00	7.90E-06	/	3.00E-03	=	2.63E-03
Vanadium	5.69E-05	x	0.00E+00	=	0.00E+00	6.64E-04	/	5.00E-03	=	1.33E-01
Zinc	4.96E-05	x	0.00E+00	=	0.00E+00	5.79E-04	/	3.00E-01	=	1.93E-03
Acetone	6.77E-09	x	0.00E+00	=	0.00E+00	7.90E-08	/	9.00E-01	=	8.78E-08
Benzene	3.59E-10	x	5.50E-02	=	1.98E-11	4.19E-09	/	4.00E-03	=	1.05E-06
Styrene	4.13E-10	x	0.00E+00	=	0.00E+00	4.82E-09	/	2.00E-01	=	2.41E-08
Toluene	8.09E-10	x	0.00E+00	=	0.00E+00	9.44E-09	/	8.00E-02	=	1.18E-07
			Pathway total	=	1.15E-05			Pathway total	=	1.51E+00

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.31E-06	x		=	NA	1.09E-04	/[	5.00E-03	x	1000	]=	2.17E-05
Antimony	3.28E-10	x		=	NA	3.82E-09	/[		x	1000	]=	NA
Arsenic	7.88E-09	x	4.30E-03	=	3.39E-11	9.19E-08	/[	1.50E-05	x	1000	]=	6.13E-06
Barium	1.09E-07	x		=	NA	1.27E-06	/[	5.00E-04	x	1000	]=	2.55E-06
Beryllium	2.65E-10	x	2.40E-03	=	6.35E-13	3.09E-09	/[	2.00E-05	x	1000	]=	1.54E-07
Boron	7.23E-09	x	0.00E+00	=	0.00E+00	8.43E-08	/[	2.00E-02	x	1000	]=	4.22E-09
Chromium	1.13E-08	x	8.40E-02	=	9.46E-10	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	9.83E-09	x	9.00E-03	=	8.85E-11	1.15E-07	/[	6.00E-06	x	1000	]=	1.91E-05
Copper	1.49E-08	x		=	NA	1.73E-07	/[		x	1000	]=	NA
Fluoride	2.27E-09	x		=	NA	2.65E-08	/[	1.30E-02	x	1000	]=	2.04E-09
Iron	2.60E-05	x		=	NA	3.03E-04	/[		x	1000	]=	NA
Lithium	1.04E-08	x		=	NA	1.21E-07	/[		x	1000	]=	NA
Manganese	4.10E-07	x		=	NA	4.78E-06	/[	5.00E-05	x	1000	]=	9.56E-05
Mercury	2.32E-11	x	0.00E+00	=	0.00E+00	2.71E-10	/[	3.00E-04	x	1000	]=	9.02E-10
Molybdenum	2.85E-09	x	0.00E+00	=	0.00E+00	3.32E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.10E-08	x	2.60E-04	=	2.87E-12	1.29E-07	/[	9.00E-05	x	1000	]=	1.43E-06
Nitrate	9.58E-09	x		=	NA	1.12E-07	/[		x	1000	]=	NA
Nitrite	2.47E-09	x		=	NA	2.88E-08	/[		x	1000	]=	NA
Selenium	2.25E-09	x	0.00E+00	=	0.00E+00	2.63E-08	/[	2.00E-02	x	1000	]=	1.31E-09
Strontium	5.58E-08	x		=	NA	6.52E-07	/[		x	1000	]=	NA
Total Uranium	6.95E-10	x		=	NA	8.11E-09	/[	4.00E-05	x	1000	]=	2.03E-07
Vanadium	5.84E-08	x		=	NA	6.82E-07	/[	1.00E-04	x	1000	]=	6.82E-06
Zinc	5.10E-08	x		=	NA	5.95E-07	/[		x	1000	]=	NA
Acetone	6.96E-12	x	0.00E+00	=	0.00E+00	8.12E-11	/[	3.10E+01	x	1000	]=	2.62E-15
Benzene	3.69E-13	x	7.80E-06	=	2.88E-18	4.31E-12	/[	3.00E-02	x	1000	]=	1.44E-13
Styrene	4.24E-13	x	0.00E+00	=	0.00E+00	4.95E-12	/[	1.00E+00	x	1000	]=	4.95E-15
Toluene	8.31E-13	x	0.00E+00	=	0.00E+00	9.69E-12	/[	5.00E+00	x	1000	]=	1.94E-15
			Pathway total =		1.07E-09					Pathway total =		1.55E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.19E-07	x	1.50E+00	=	9.29E-07	7.22E-06	/	3.00E-04	=	2.41E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		9.29E-07			Pathway total =		2.41E-02

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.1E-01**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-03	1%
Arsenic	Sum of all pathways	=	1.24E-05	Sum of all pathways	=	**3.2E-01**	21%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-03	0%
Beryllium	Sum of all pathways	=	6.35E-13	Sum of all pathways	=	1.5E-03	0%
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-04	0%
Chromium	Sum of all pathways	=	9.46E-10	Sum of all pathways	=	**4.3E-02**	3%
Cobalt	Sum of all pathways	=	8.85E-11	Sum of all pathways	=	**3.7E-01**	24%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.2E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.2E-01**	27%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.9E-02**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.3E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	9.0E-10	0%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	6.5E-03	0%
Nickel	Sum of all pathways	=	2.87E-12	Sum of all pathways	=	6.3E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	9.3E-05	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-03	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.3E-01**	9%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	8.8E-08	0%
Benzene	Sum of all pathways	=	1.98E-11	Sum of all pathways	=	1.0E-06	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.24E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.54E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Residential Child Receptor

Exposure Pathways	Exposure Areas									
	A plus B	**C**	**E**	**F plus G**	**H plus I**	**J**	**L1 plus L2**	**P**	**R**	**U**
Carcinogenic Risk for Residential Child- Nonradiological COPCs										
Soil Ingestion	6E-06	3E-05	9E-06	6E-06	8E-06	1E-05	6E-06	8E-06	1E-05	1E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	7E-07	5E-07	7E-07	1E-06	5E-07	7E-07	8E-07	9E-07
ELCR	7E-06	**4E-05**	9E-06	6E-06	9E-06	1E-05	6E-06	9E-06	1E-05	1E-05
Major Risk Contributors	None	None	None							
Noncancer Hazard For Residential Child- Nonradiological COPCs										
Soil Ingestion	1.4	**2.4**	1.5	1.4	**1.6**	**1.6**	1.3	1.5	1.7	1.5
Inhalation	1E-04	2E-04	2E-04	2E-04	2E-04	1.64E-04	1E-04	2E-04	2E-04	2E-04
Dermal Contact	0.01	0.07	0.02	0.01	0.02	0.03	0.01	0.02	0.02	0.02
HI	**1.4**	**2.5**	**1.6**	**1.4**	**1.6**	**1.6**	**1.3**	**1.6**	**1.7**	**1.5**
Major Hazard Contributors	**Common for All EAs** Aluminum, Arsenic, Chromium, Cobalt, Iron, Lithium, Manganese, and Vanadium **Specific to EA J** Antimony **Specific to EA E and EA R** Cadmium									

Appendix C

Attachment C-9: Results of Nonradiological Risk Assessment for Residential Receptor Scenario Based on MTCA Method B Standard

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	7.55E-03	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.65E-07	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	3.75E-06	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	8.50E-05	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	9.67E-08	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	9.54E-06	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	9.09E-06	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.28E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	2.23E-06	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.41E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	8.33E-06	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.54E-04	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.08E-05	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	9.06E-06	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	9.25E-07	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	4.83E-08	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.77E-05	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Tin	1.16E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	5.77E-07	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	6.00E-05	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	4.56E-05	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Diethylphthalate	3.40E-07	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Aroclor-1254	7.54E-09	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	9.44E-02	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.32E-06	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	4.69E-05	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.06E-03	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.21E-06	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.19E-04	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.14E-04	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.59E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	2.78E-05	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.01E-01	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.04E-04	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.43E-03	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.36E-04	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	1.13E-04	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	1.16E-05	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	6.03E-07	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.72E-04	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Tin	1.45E-04	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	7.21E-06	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	7.50E-04	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	5.70E-04	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Diethylphthalate	4.25E-06	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Aroclor-1254	9.42E-08	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	

CARCINOGENIC EFFECTS

Aluminum	1.18E-08	=	[	1.0E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.15E-13	=	[	3.6E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.87E-12	=	[	5.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.33E-10	=	[	1.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.51E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.49E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.42E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.00E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.48E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.77E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.30E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.54E-10	=	[	4.8E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.70E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.42E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	1.45E-12	=	[	1.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	7.56E-14	=	[	6.6E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.91E-11	=	[	5.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	1.82E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	9.04E-13	=	[	7.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.39E-11	=	[	8.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.14E-11	=	[	6.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Diethylphthalate	5.32E-13	=	[	4.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1254	4.92E-13	=	[	1.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	24	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	

NONCARCINOGENIC EFFECTS

Aluminum	6.46E-08	=	[	1.0E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.27E-12	=	[	3.6E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	3.21E-11	=	[	5.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	7.28E-10	=	[	1.2E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	8.28E-13	=	[	1.3E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	8.17E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.79E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.09E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.90E-11	=	[	3.0E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.06E-07	=	[	3.3E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.13E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.03E-09	=	[	4.8E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	9.28E-11	=	[	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	7.76E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	7.92E-12	=	[	1.3E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	4.13E-13	=	[	6.6E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	3.23E-10	=	[	5.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Tin	9.93E-11	=	[	1.6E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	4.94E-12	=	[	7.9E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.13E-10	=	[	8.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.90E-10	=	[	6.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Diethylphthalate	2.91E-12	=	[	4.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Aroclor-1254	6.45E-14	=	[	1.0E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.55E-03	x	0.00E+00	=	0.00E+00	9.44E-02	/	1.00E+00	=	9.44E-02
Antimony	2.65E-07	x	0.00E+00	=	0.00E+00	3.32E-06	/	4.00E-04	=	8.29E-03
Arsenic	3.75E-06	x	1.50E+00	=	5.63E-06	4.69E-05	/	3.00E-04	=	**1.56E-01**
Barium	8.50E-05	x	0.00E+00	=	0.00E+00	1.06E-03	/	2.00E-01	=	5.31E-03
Cadmium	9.67E-08	x	0.00E+00	=	0.00E+00	1.21E-06	/	1.00E-03	=	1.21E-03
Chromium	9.54E-06	x	0.00E+00	=	0.00E+00	1.19E-04	/	3.00E-03	=	3.97E-02
Cobalt	9.09E-06	x	0.00E+00	=	0.00E+00	1.14E-04	/	3.00E-04	=	**3.79E-01**
Copper	1.28E-05	x	0.00E+00	=	0.00E+00	1.59E-04	/	4.00E-02	=	3.99E-03
Fluoride	2.23E-06	x	0.00E+00	=	0.00E+00	2.78E-05	/	4.00E-02	=	6.95E-04
Iron	2.41E-02	x	0.00E+00	=	0.00E+00	3.01E-01	/	7.00E-01	=	**4.30E-01**
Lithium	8.33E-06	x	0.00E+00	=	0.00E+00	1.04E-04	/	2.00E-03	=	5.21E-02
Manganese	3.54E-04	x	0.00E+00	=	0.00E+00	4.43E-03	/	1.40E-01	=	3.16E-02
Nickel	1.08E-05	x	0.00E+00	=	0.00E+00	1.36E-04	/	2.00E-02	=	6.78E-03
Nitrate	9.06E-06	x	0.00E+00	=	0.00E+00	1.13E-04	/	7.10E+00	=	1.60E-05
Nitrite	9.25E-07	x	0.00E+00	=	0.00E+00	1.16E-05	/	3.00E-01	=	3.86E-05
Silver	4.83E-08	x	0.00E+00	=	0.00E+00	6.03E-07	/	5.00E-03	=	1.21E-04
Strontium	3.77E-05	x	0.00E+00	=	0.00E+00	4.72E-04	/	6.00E-01	=	7.86E-04
Tin	1.16E-05	x	0.00E+00	=	0.00E+00	1.45E-04	/	6.00E-01	=	2.42E-04
Total Uranium	5.77E-07	x	0.00E+00	=	0.00E+00	7.21E-06	/	3.00E-03	=	2.40E-03
Vanadium	6.00E-05	x	0.00E+00	=	0.00E+00	7.50E-04	/	5.00E-03	=	**1.50E-01**
Zinc	4.56E-05	x	0.00E+00	=	0.00E+00	5.70E-04	/	3.00E-01	=	1.90E-03
Diethylphthalate	3.40E-07	x	0.00E+00	=	0.00E+00	4.25E-06	/	8.00E-01	=	5.31E-06
Aroclor-1254	7.54E-09	x	2.00E+00	=	1.51E-08	9.42E-08	/	2.00E-05	=	4.71E-03
			Pathway total	=	5.64E-06			Pathway total	=	1.37E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.18E-08	x		=	0.00E+00	6.46E-08	/	1.43E-03	=	4.52E-05
Antimony	4.15E-13	x		=	0.00E+00	2.27E-12	/		=	NA
Arsenic	5.87E-12	x	1.51E+01	=	8.84E-11	3.21E-11	/	4.29E-06	=	7.49E-06
Barium	1.33E-10	x		=	0.00E+00	7.28E-10	/	1.43E-04	=	5.09E-06
Cadmium	1.51E-13	x	6.30E+00	=	9.54E-13	8.28E-13	/	2.86E-06	=	2.90E-07
Chromium	1.49E-11	x		=	0.00E+00	8.17E-11	/		=	NA
Cobalt	1.42E-11	x	3.15E+01	=	4.48E-10	7.79E-11	/	1.71E-06	=	4.54E-05
Copper	2.00E-11	x		=	0.00E+00	1.09E-10	/		=	NA
Fluoride	3.48E-12	x		=	0.00E+00	1.90E-11	/	3.71E-03	=	5.13E-09
Iron	3.77E-08	x		=	0.00E+00	2.06E-07	/		=	NA
Lithium	1.30E-11	x		=	0.00E+00	7.13E-11	/		=	NA
Manganese	5.54E-10	x		=	0.00E+00	3.03E-09	/	1.43E-05	=	2.12E-04
Nickel	1.70E-11	x	9.10E-01	=	1.54E-11	9.28E-11	/	2.57E-05	=	3.61E-06
Nitrate	1.42E-11	x		=	0.00E+00	7.76E-11	/		=	NA
Nitrite	1.45E-12	x		=	0.00E+00	7.92E-12	/		=	NA
Silver	7.56E-14	x		=	0.00E+00	4.13E-13	/		=	NA
Strontium	5.91E-11	x		=	0.00E+00	3.23E-10	/		=	NA
Tin	1.82E-11	x		=	0.00E+00	9.93E-11	/		=	NA
Total Uranium	9.04E-13	x		=	0.00E+00	4.94E-12	/	1.14E-05	=	4.32E-07
Vanadium	9.39E-11	x		=	0.00E+00	5.13E-10	/	2.86E-05	=	1.80E-05
Zinc	7.14E-11	x		=	0.00E+00	3.90E-10	/		=	NA
Diethylphthalate	5.32E-13	x		=	0.00E+00	2.91E-12	/		=	NA
Aroclor-1254	4.92E-13	x	2.00E+00	=	9.81E-13	6.45E-14	/		=	NA
			Pathway total =		5.54E-10			Pathway total =		3.38E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**9.4E-02**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	8.3E-03	1%
Arsenic	Sum of all pathways	=	5.63E-06	Sum of all pathways	=	**1.6E-01**	11%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-03	0%
Cadmium	Sum of all pathways	=	9.54E-13	Sum of all pathways	=	1.2E-03	0%
Chromium	Sum of all pathways	=	NA	Sum of all pathways	=	**4.0E-02**	3%
Cobalt	Sum of all pathways	=	4.48E-10	Sum of all pathways	=	**3.8E-01**	28%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	7.0E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.3E-01**	31%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.2E-02**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.2E-02**	2%
Nickel	Sum of all pathways	=	1.54E-11	Sum of all pathways	=	6.8E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	3.9E-05	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-04	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.5E-01**	11%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03	0%
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	5.3E-06	0%
Aroclor-1254	Sum of all pathways	=	1.51E-08	Sum of all pathways	=	4.7E-03	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	6E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.4E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	9.51E-03	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	7.21E-07	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	2.12E-05	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	9.88E-05	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	4.03E-07	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	1.50E-07	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.28E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	1.10E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.81E-05	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	2.29E-06	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.86E-02	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	1.21E-05	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	4.49E-04	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	5.06E-09	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.30E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	1.74E-05	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	2.11E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	8.00E-08	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	4.47E-05	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	8.45E-07	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	7.85E-05	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	5.11E-05	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	8.07E-08	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	1.19E-01	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	9.01E-06	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	2.65E-04	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.24E-03	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	5.04E-06	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.88E-06	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.60E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.38E-04	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	2.26E-04	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	2.86E-05	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.58E-01	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.51E-04	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	5.61E-03	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	6.33E-08	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.63E-04	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	2.18E-04	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	2.64E-05	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	1.00E-06	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	5.59E-04	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	1.06E-05	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	9.81E-04	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	6.39E-04	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	1.01E-06	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.49E-08	=	[	1.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	1.13E-12	=	[	9.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	3.32E-11	=	[	2.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.55E-10	=	[	1.4E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	6.31E-13	=	[	5.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	2.35E-13	=	[	2.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.00E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.72E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.83E-11	=	[	2.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.59E-12	=	[	3.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	4.48E-08	=	[	3.9E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.89E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	7.03E-10	=	[	6.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	7.92E-15	=	[	6.9E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.04E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	2.72E-11	=	[	2.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.30E-12	=	[	2.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.25E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	7.00E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.32E-12	=	[	1.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.23E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	8.00E-11	=	[	7.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.26E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	= [	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x ABW	x	UCF	)]
Units	mg/kg-day		ug/m^3		unitless		m^3/day		years				years	kg		ug/mg	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.14E-08	=	1.3E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	6.17E-12	=	9.9E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	1.82E-10	=	2.9E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	8.46E-10	=	1.4E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	3.45E-12	=	5.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	1.28E-12	=	2.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	1.10E-10	=	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	9.42E-11	=	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.55E-10	=	2.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.96E-11	=	3.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.45E-07	=	3.9E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	1.04E-10	=	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.84E-09	=	6.2E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	4.33E-14	=	6.9E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	1.11E-10	=	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	1.49E-10	=	2.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	1.81E-11	=	2.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	6.85E-13	=	1.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	3.83E-10	=	6.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	7.24E-12	=	1.2E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	6.72E-10	=	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	4.38E-10	=	7.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	6.91E-13	=	1.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

RPP-RPT-58329, Rev. 3

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	9.51E-03	x	0.00E+00	=	0.00E+00	1.19E-01	/	1.00E+00	=	**1.19E-01**
Antimony	7.21E-07	x	0.00E+00	=	0.00E+00	9.01E-06	/	4.00E-04	=	2.25E-02
Arsenic	2.12E-05	x	1.50E+00	=	3.18E-05	2.65E-04	/	3.00E-04	=	**8.83E-01**
Barium	9.88E-05	x	0.00E+00	=	0.00E+00	1.24E-03	/	2.00E-01	=	6.18E-03
Beryllium	4.03E-07	x	0.00E+00	=	0.00E+00	5.04E-06	/	2.00E-03	=	2.52E-03
Cadmium	1.50E-07	x	0.00E+00	=	0.00E+00	1.88E-06	/	1.00E-03	=	1.88E-03
Chromium	1.28E-05	x	0.00E+00	=	0.00E+00	1.60E-04	/	3.00E-03	=	5.33E-02
Cobalt	1.10E-05	x	0.00E+00	=	0.00E+00	1.38E-04	/	3.00E-04	=	**4.58E-01**
Copper	1.81E-05	x	0.00E+00	=	0.00E+00	2.26E-04	/	4.00E-02	=	5.66E-03
Fluoride	2.29E-06	x	0.00E+00	=	0.00E+00	2.86E-05	/	4.00E-02	=	7.16E-04
Iron	2.86E-02	x	0.00E+00	=	0.00E+00	3.58E-01	/	7.00E-01	=	**5.11E-01**
Lithium	1.21E-05	x	0.00E+00	=	0.00E+00	1.51E-04	/	2.00E-03	=	7.56E-02
Manganese	4.49E-04	x	0.00E+00	=	0.00E+00	5.61E-03	/	1.40E-01	=	4.01E-02
Mercury	5.06E-09	x	0.00E+00	=	0.00E+00	6.33E-08	/	0.00E+00	=	**NA**
Nickel	1.30E-05	x	0.00E+00	=	0.00E+00	1.63E-04	/	2.00E-02	=	8.13E-03
Nitrate	1.74E-05	x	0.00E+00	=	0.00E+00	2.18E-04	/	7.10E+00	=	3.06E-05
Nitrite	2.11E-06	x	0.00E+00	=	0.00E+00	2.64E-05	/	3.00E-01	=	8.79E-05
Silver	8.00E-08	x	0.00E+00	=	0.00E+00	1.00E-06	/	5.00E-03	=	2.00E-04
Strontium	4.47E-05	x	0.00E+00	=	0.00E+00	5.59E-04	/	6.00E-01	=	9.31E-04
Total Uranium	8.45E-07	x	0.00E+00	=	0.00E+00	1.06E-05	/	3.00E-03	=	3.52E-03
Vanadium	7.85E-05	x	0.00E+00	=	0.00E+00	9.81E-04	/	5.00E-03	=	**1.96E-01**
Zinc	5.11E-05	x	0.00E+00		0.00E+00	6.39E-04	/	3.00E-01	=	2.13E-03
Butylbenzylphthalate	8.07E-08	x	1.90E-03	=	1.53E-10	1.01E-06	/	2.00E-01	=	5.04E-06
			Pathway total	=	3.18E-05			Pathway total	=	**2.39E+00**

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.49E-08	x	0.00E+00	=	0.00E+00	8.14E-08	/	1.43E-03	=	5.70E-05
Antimony	1.13E-12	x	0.00E+00	=	0.00E+00	6.17E-12	/	0.00E+00	=	NA
Arsenic	3.32E-11	x	1.51E+01	=	5.00E-10	1.82E-10	/	4.29E-06	=	4.24E-05
Barium	1.55E-10	x	0.00E+00	=	0.00E+00	8.46E-10	/	1.43E-04	=	5.92E-06
Beryllium	6.31E-13	x	8.40E+00	=	5.30E-12	3.45E-12	/	5.71E-06	=	6.04E-07
Cadmium	2.35E-13	x	6.30E+00	=	1.48E-12	1.28E-12	/	2.86E-06	=	4.49E-07
Chromium	2.00E-11	x	0.00E+00	=	0.00E+00	1.10E-10	/	0.00E+00	=	NA
Cobalt	1.72E-11	x	3.15E+01	=	5.42E-10	9.42E-11	/	1.71E-06	=	5.49E-05
Copper	2.83E-11	x	0.00E+00	=	0.00E+00	1.55E-10	/	0.00E+00	=	NA
Fluoride	3.59E-12	x	0.00E+00	=	0.00E+00	1.96E-11	/	3.71E-03	=	5.28E-09
Iron	4.48E-08	x	0.00E+00	=	0.00E+00	2.45E-07	/	0.00E+00	=	NA
Lithium	1.89E-11	x	0.00E+00	=	0.00E+00	1.04E-10	/	0.00E+00	=	NA
Manganese	7.03E-10	x	0.00E+00	=	0.00E+00	3.84E-09	/	1.43E-05	=	2.69E-04
Mercury	7.92E-15	x	0.00E+00	=	0.00E+00	4.33E-14	/	8.57E-05	=	5.05E-10
Nickel	2.04E-11	x	9.10E-01	=	1.85E-11	1.11E-10	/	2.57E-05	=	4.33E-06
Nitrate	2.72E-11	x	0.00E+00	=	0.00E+00	1.49E-10	/	0.00E+00	=	NA
Nitrite	3.30E-12	x	0.00E+00	=	0.00E+00	1.81E-11	/	0.00E+00	=	NA
Silver	1.25E-13	x	0.00E+00	=	0.00E+00	6.85E-13	/	0.00E+00	=	NA
Strontium	7.00E-11	x	0.00E+00	=	0.00E+00	3.83E-10	/	0.00E+00	=	NA
Total Uranium	1.32E-12	x	0.00E+00	=	0.00E+00	7.24E-12	/	1.14E-05	=	6.33E-07
Vanadium	1.23E-10	x	0.00E+00	=	0.00E+00	6.72E-10	/	2.86E-05	=	2.35E-05
Zinc	8.00E-11	x	0.00E+00			4.38E-10	/	0.00E+00	=	NA
Butylbenzylphthalate	1.26E-13	x	0.00E+00	=	0.00E+00	6.91E-13	/	0.00E+00	=	NA
			Pathway total =		1.07E-09			Pathway total =		4.59E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.2E-01**	5%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.3E-02	1%
Arsenic	Sum of all pathways	=	**3.18E-05**	Sum of all pathways	=	**8.8E-01**	37%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.2E-03	0%
Beryllium	Sum of all pathways	=	5.30E-12	Sum of all pathways	=	2.5E-03	0%
Cadmium	Sum of all pathways	=	1.48E-12	Sum of all pathways	=	1.9E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.3E-02**	2%
Cobalt	Sum of all pathways	=	5.42E-10	Sum of all pathways	=	**4.6E-01**	19%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.7E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.2E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.1E-01**	21%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**7.6E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.0E-02**	2%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.1E-10	0%
Nickel	Sum of all pathways	=	1.85E-11	Sum of all pathways	=	8.1E-03	0%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.1E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.8E-05	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.3E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.5E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**2.0E-01**	8%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.53E-10	Sum of all pathways	=	5.0E-06	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**3.2E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**2.4E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation Units	CDIingestion = mg/kg-day	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																				
Aluminum	7.42E-03	=	7.42E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	1.78E-07	=	1.78E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	5.20E-06	=	5.20E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	7.84E-05	=	7.84E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	1.59E-07	=	1.59E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Boron	3.34E-06	=	3.34E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	3.26E-06	=	3.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.72E-05	=	1.72E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	8.82E-06	=	8.82E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.65E-05	=	1.65E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	1.48E-06	=	1.48E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.42E-02	=	2.42E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	9.13E-06	=	9.13E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	4.95E-04	=	4.95E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	2.32E-08	=	2.32E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.24E-05	=	1.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	5.02E-06	=	5.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	1.40E-06	=	1.40E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Selenium	5.60E-07	=	5.60E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	8.50E-08	=	8.50E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.47E-05	=	3.47E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	8.27E-07	=	8.27E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	5.88E-05	=	5.88E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	4.48E-05	=	4.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Acetone	6.63E-09	=	6.63E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	1.24E-07	=	1.24E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	3.37E-10	=	3.37E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Aldrin	2.00E-09	=	2.00E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	9.28E-02	=	[	7.42E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	2.23E-06	=	[	1.78E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	6.50E-05	=	[	5.20E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	9.80E-04	=	[	7.84E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	1.99E-06	=	[	1.59E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Boron	4.18E-05	=	[	3.34E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	4.08E-05	=	[	3.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	2.15E-04	=	[	1.72E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.10E-04	=	[	8.82E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	2.06E-04	=	[	1.65E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	1.85E-05	=	[	1.48E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.03E-01	=	[	2.42E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.14E-04	=	[	9.13E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	6.19E-03	=	[	4.95E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	2.90E-07	=	[	2.32E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.55E-04	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	6.28E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	1.75E-05	=	[	1.40E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Selenium	7.00E-06	=	[	5.60E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	1.06E-06	=	[	8.50E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.34E-04	=	[	3.47E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	1.03E-05	=	[	8.27E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	7.35E-04	=	[	5.88E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	5.60E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Acetone	8.29E-08	=	[	6.63E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	1.55E-06	=	[	1.24E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	4.21E-09	=	[	3.37E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Aldrin	2.50E-08	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.16E-08	=	[	1.0E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	2.79E-13	=	[	2.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	8.14E-12	=	[	7.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.23E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	2.49E-13	=	[	2.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	5.23E-12	=	[	4.6E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	5.10E-12	=	[	4.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.69E-11	=	[	2.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.38E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.58E-11	=	[	2.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.32E-12	=	[	2.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.79E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.43E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	7.75E-10	=	[	6.8E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.63E-14	=	[	3.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.94E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	7.86E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	2.19E-12	=	[	1.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	8.77E-13	=	[	7.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.33E-13	=	[	1.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.43E-11	=	[	4.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.29E-12	=	[	1.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.21E-11	=	[	8.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.01E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	1.04E-14	=	[	9.1E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.94E-13	=	[	1.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	5.28E-16	=	[	4.6E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aldrin	3.13E-15	=	[	2.7E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	6.35E-08	=	[	1.0E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	1.52E-12	=	[	2.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	4.45E-11	=	[	7.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	6.71E-10	=	[	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	1.36E-12	=	[	2.2E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Boron	2.86E-11	=	[	4.6E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	2.79E-11	=	[	4.5E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	1.47E-10	=	[	2.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.55E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.41E-10	=	[	2.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.27E-11	=	[	2.0E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.07E-07	=	[	3.3E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.82E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	4.24E-09	=	[	6.8E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.99E-13	=	[	3.2E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	1.06E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	4.30E-11	=	[	6.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	1.20E-11	=	[	1.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Selenium	4.79E-12	=	[	7.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	7.28E-13	=	[	1.2E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	2.97E-10	=	[	4.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	7.08E-12	=	[	1.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.03E-10	=	[	8.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.84E-10	=	[	6.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Acetone	5.68E-14	=	[	9.1E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	1.06E-12	=	[	1.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	2.89E-15	=	[	4.6E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Aldrin	1.71E-14	=	[	2.7E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.42E-03	x	0.00E+00	=	0.00E+00	9.28E-02	/	1.00E+00	=	9.28E-02
Antimony	1.78E-07	x	0.00E+00	=	0.00E+00	2.23E-06	/	4.00E-04	=	5.56E-03
Arsenic	5.20E-06	x	1.50E+00	=	7.80E-06	6.50E-05	/	3.00E-04	=	2.17E-01
Barium	7.84E-05	x	0.00E+00	=	0.00E+00	9.80E-04	/	2.00E-01	=	4.90E-03
Beryllium	1.59E-07	x	0.00E+00	=	0.00E+00	1.99E-06	/	2.00E-03	=	9.94E-04
Boron	3.34E-06	x	0.00E+00	=	0.00E+00	4.18E-05	/	2.00E-01	=	2.09E-04
Cadmium	3.26E-06	x	0.00E+00	=	0.00E+00	4.08E-05	/	1.00E-03	=	4.08E-02
Chromium	1.72E-05	x	0.00E+00	=	0.00E+00	2.15E-04	/	3.00E-03	=	7.17E-02
Cobalt	8.82E-06	x	0.00E+00	=	0.00E+00	1.10E-04	/	3.00E-04	=	3.68E-01
Copper	1.65E-05	x	0.00E+00	=	0.00E+00	2.06E-04	/	4.00E-02	=	5.16E-03
Fluoride	1.48E-06	x	0.00E+00	=	0.00E+00	1.85E-05	/	4.00E-02	=	4.63E-04
Iron	2.42E-02	x	0.00E+00	=	0.00E+00	3.03E-01	/	7.00E-01	=	4.32E-01
Lithium	9.13E-06	x	0.00E+00	=	0.00E+00	1.14E-04	/	2.00E-03	=	5.71E-02
Manganese	4.95E-04	x	0.00E+00	=	0.00E+00	6.19E-03	/	1.40E-01	=	4.42E-02
Mercury	2.32E-08	x	0.00E+00	=	0.00E+00	2.90E-07	/	0.00E+00	=	NA
Nickel	1.24E-05	x	0.00E+00	=	0.00E+00	1.55E-04	/	2.00E-02	=	7.75E-03
Nitrate	5.02E-06	x	0.00E+00	=	0.00E+00	6.28E-05	/	7.10E+00	=	8.84E-06
Nitrite	1.40E-06	x	0.00E+00	=	0.00E+00	1.75E-05	/	3.00E-01	=	5.83E-05
Selenium	5.60E-07	x	0.00E+00	=	0.00E+00	7.00E-06	/	5.00E-03	=	1.40E-03
Silver	8.50E-08	x	0.00E+00	=	0.00E+00	1.06E-06	/	5.00E-03	=	2.13E-04
Strontium	3.47E-05	x	0.00E+00	=	0.00E+00	4.34E-04	/	6.00E-01	=	7.23E-04
Total Uranium	8.27E-07	x	0.00E+00	=	0.00E+00	1.03E-05	/	3.00E-03	=	3.45E-03
Vanadium	5.88E-05	x	0.00E+00	=	0.00E+00	7.35E-04	/	5.00E-03	=	1.47E-01
Zinc	4.48E-05	x	0.00E+00	=	0.00E+00	5.60E-04	/	3.00E-01	=	1.87E-03
Acetone	6.63E-09	x	0.00E+00	=	0.00E+00	8.29E-08	/	9.00E-01	=	9.21E-08
Butylbenzylphthalate	1.24E-07	x	1.90E-03	=	2.36E-10	1.55E-06	/	2.00E-01	=	7.75E-06
Toluene	3.37E-10	x	0.00E+00	=	0.00E+00	4.21E-09	/	8.00E-02	=	5.27E-08
Aldrin	2.00E-09	x	1.70E+01	=	3.40E-08	2.50E-08	/	3.00E-05	=	8.33E-04
			Pathway total	=	7.83E-06			Pathway total	=	1.50E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.16E-08	x	0.00E+00	=	0.00E+00	6.35E-08	/	1.43E-03	=	4.45E-05
Antimony	2.79E-13	x	0.00E+00	=	0.00E+00	1.52E-12	/	0.00E+00	=	NA
Arsenic	8.14E-12	x	1.51E+01	=	1.23E-10	4.45E-11	/	4.29E-06	=	1.04E-05
Barium	1.23E-10	x	0.00E+00	=	0.00E+00	6.71E-10	/	1.43E-04	=	4.70E-06
Beryllium	2.49E-13	x	8.40E+00	=	2.09E-12	1.36E-12	/	5.71E-06	=	2.38E-07
Boron	5.23E-12	x	0.00E+00	=	0.00E+00	2.86E-11	/	5.71E-03	=	5.00E-09
Cadmium	5.10E-12	x	6.30E+00	=	3.22E-11	2.79E-11	/	2.86E-06	=	9.77E-06
Chromium	2.69E-11	x	0.00E+00	=	0.00E+00	1.47E-10	/	0.00E+00	=	NA
Cobalt	1.38E-11	x	3.15E+01	=	4.35E-10	7.55E-11	/	1.71E-06	=	4.40E-05
Copper	2.58E-11	x	0.00E+00	=	0.00E+00	1.41E-10	/	0.00E+00	=	NA
Fluoride	2.32E-12	x	0.00E+00	=	0.00E+00	1.27E-11	/	3.71E-03	=	3.41E-09
Iron	3.79E-08	x	0.00E+00	=	0.00E+00	2.07E-07	/	0.00E+00	=	NA
Lithium	1.43E-11	x	0.00E+00	=	0.00E+00	7.82E-11	/	0.00E+00	=	NA
Manganese	7.75E-10	x	0.00E+00	=	0.00E+00	4.24E-09	/	1.43E-05	=	2.97E-04
Mercury	3.63E-14	x	0.00E+00	=	0.00E+00	1.99E-13	/	8.57E-05	=	2.32E-09
Nickel	1.94E-11	x	9.10E-01	=	1.77E-11	1.06E-10	/	2.57E-05	=	4.13E-06
Nitrate	7.86E-12	x	0.00E+00	=	0.00E+00	4.30E-11	/	0.00E+00	=	NA
Nitrite	2.19E-12	x	0.00E+00	=	0.00E+00	1.20E-11	/	0.00E+00	=	NA
Selenium	8.77E-13	x	0.00E+00	=	0.00E+00	4.79E-12	/	5.71E-03	=	8.39E-10
Silver	1.33E-13	x	0.00E+00	=	0.00E+00	7.28E-13	/	0.00E+00	=	NA
Strontium	5.43E-11	x	0.00E+00	=	0.00E+00	2.97E-10	/	0.00E+00	=	NA
Total Uranium	1.29E-12	x	0.00E+00	=	0.00E+00	7.08E-12	/	1.14E-05	=	6.20E-07
Vanadium	9.21E-11	x	0.00E+00	=	0.00E+00	5.03E-10	/	2.86E-05	=	1.76E-05
Zinc	7.01E-11	x	0.00E+00	=	0.00E+00	3.84E-10	/	0.00E+00	=	NA
Acetone	1.04E-14	x	0.00E+00	=	0.00E+00	5.68E-14	/	8.86E+00	=	6.41E-15
Butylbenzylphthalate	1.94E-13	x	0.00E+00	=	0.00E+00	1.06E-12	/	0.00E+00	=	NA
Toluene	5.28E-16	x	0.00E+00	=	0.00E+00	2.89E-15	/	1.43E+00	=	2.02E-15
Aldrin	3.13E-15	x	1.72E+01	=	5.37E-14	1.71E-14	/	0.00E+00	=	NA
			Pathway total =		6.09E-10			Pathway total =		4.33E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**9.3E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.6E-03	0%
Arsenic	Sum of all pathways	=	**7.80E-06**	Sum of all pathways	=	**2.2E-01**	14%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.9E-03	0%
Beryllium	Sum of all pathways	=	2.09E-12	Sum of all pathways	=	9.9E-04	0%
Boron	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-04	0%
Cadmium	Sum of all pathways	=	3.22E-11	Sum of all pathways	=	**4.1E-02**	3%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**7.2E-02**	5%
Cobalt	Sum of all pathways	=	4.35E-10	Sum of all pathways	=	**3.7E-01**	24%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.6E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.3E-01**	29%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.7E-02**	4%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.4E-02**	3%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.3E-09	0%
Nickel	Sum of all pathways	=	1.77E-11	Sum of all pathways	=	7.8E-03	1%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.8E-06	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.8E-05	0%
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-03	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.1E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.2E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.4E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.5E-01**	10%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.9E-03	0%
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.2E-08	0%
Butylbenzylphthalate	Sum of all pathways	=	2.36E-10	Sum of all pathways	=	7.8E-06	0%
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.3E-08	0%
Aldrin	Sum of all pathways	=	3.40E-08	Sum of all pathways	=	8.3E-04	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	7.8E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	1.50E+00

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	6.76E-03	=	[	6.76E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.47E-07	=	[	2.47E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	3.49E-06	=	[	3.49E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	9.41E-05	=	[	9.41E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	2.98E-07	=	[	2.98E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	1.17E-07	=	[	1.17E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	8.98E-06	=	[	8.98E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	8.18E-06	=	[	8.18E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.30E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	2.11E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.39E-02	=	[	2.39E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	7.43E-06	=	[	7.43E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.86E-04	=	[	3.86E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	3.04E-08	=	[	3.04E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.13E-05	=	[	1.13E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	7.15E-06	=	[	7.15E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	3.06E-06	=	[	3.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	8.18E-08	=	[	8.18E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.62E-05	=	[	3.62E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Tin	6.36E-06	=	[	6.36E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	7.15E-07	=	[	7.15E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	6.97E-05	=	[	6.97E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	3.83E-05	=	[	3.83E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
2-Butanone	2.48E-09	=	[	2.48E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Bis(2-ethylhexyl) phthalate	4.03E-06	=	[	4.03E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	5.92E-08	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Hexane	3.59E-08	=	[	3.59E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Methylene chloride	2.00E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
o-Xylene	1.28E-10	=	[	1.28E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Styrene	6.54E-10	=	[	6.54E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	9.78E-10	=	[	9.78E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Xylenes (total)	4.63E-10	=	[	4.63E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
beta-BHC	2.52E-08	=	[	2.52E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Gamma-BHC (Lindane)	5.10E-09	=	[	5.10E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Aroclor-1260	2.06E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
NONCARCINOGENIC EFFECTS																				
Aluminum	8.45E-02	=	[	6.76E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.09E-06	=	[	2.47E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	4.36E-05	=	[	3.49E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.18E-03	=	[	9.41E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	3.73E-06	=	[	2.98E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.46E-06	=	[	1.17E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.12E-04	=	[	8.98E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.02E-04	=	[	8.18E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.63E-04	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	2.64E-05	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	2.99E-01	=	[	2.39E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	9.28E-05	=	[	7.43E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.83E-03	=	[	3.86E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	3.80E-07	=	[	3.04E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.41E-04	=	[	1.13E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	8.94E-05	=	[	7.15E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	3.82E-05	=	[	3.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	1.02E-06	=	[	8.18E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.52E-04	=	[	3.62E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Tin	7.95E-05	=	[	6.36E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	8.94E-06	=	[	7.15E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	8.72E-04	=	[	6.97E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	4.79E-04	=	[	3.83E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
2-Butanone	3.11E-08	=	[	2.48E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Bis(2-ethylhexyl) phthalate	5.04E-05	=	[	4.03E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	7.40E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Hexane	4.49E-07	=	[	3.59E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Methylene chloride	2.50E-08	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
o-Xylene	1.60E-09	=	[	1.28E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Styrene	8.18E-09	=	[	6.54E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	1.22E-08	=	[	9.78E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Xylenes (total)	5.79E-09	=	[	4.63E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
beta-BHC	3.16E-07	=	[	2.52E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Gamma-BHC (Lindane)	6.38E-08	=	[	5.10E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Aroclor-1260	2.58E-07	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.06E-08	=	[	9.3E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.87E-13	=	[	3.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.46E-12	=	[	4.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.47E-10	=	[	1.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	4.67E-13	=	[	4.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.82E-13	=	[	1.6E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.41E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.28E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.04E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.31E-12	=	[	2.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.75E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.16E-11	=	[	1.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.05E-10	=	[	5.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	4.76E-14	=	[	4.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.76E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.12E-11	=	[	9.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	4.79E-12	=	[	4.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.28E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.66E-11	=	[	5.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	9.96E-12	=	[	8.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.12E-12	=	[	9.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.09E-10	=	[	9.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	6.00E-11	=	[	5.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
2-Butanone	3.89E-15	=	[	3.4E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	6.31E-12	=	[	5.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	9.27E-14	=	[	8.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Hexane	5.62E-14	=	[	4.9E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Methylene chloride	3.13E-15	=	[	2.7E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
o-Xylene	2.00E-16	=	[	1.8E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	1.02E-15	=	[	9.0E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	1.53E-15	=	[	1.3E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Xylenes (total)	7.25E-16	=	[	6.3E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	3.95E-14	=	[	3.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Gamma-BHC (Lindane)	7.98E-15	=	[	7.0E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1260	3.23E-14	=	[	2.8E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	5.79E-08	=	[	9.3E-05	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.12E-12	=	[	3.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	2.99E-11	=	[	4.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	8.06E-10	=	[	1.3E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	2.55E-12	=	[	4.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	9.98E-13	=	[	1.6E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	7.69E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.01E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.12E-10	=	[	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.81E-11	=	[	2.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.05E-07	=	[	3.3E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	6.36E-11	=	[	1.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.31E-09	=	[	5.3E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	2.60E-13	=	[	4.2E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	9.63E-11	=	[	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	6.13E-11	=	[	9.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	2.62E-11	=	[	4.2E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	7.00E-13	=	[	1.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	3.10E-10	=	[	5.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Tin	5.45E-11	=	[	8.7E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	6.12E-12	=	[	9.8E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.97E-10	=	[	9.6E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.28E-10	=	[	5.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
2-Butanone	2.13E-14	=	[	3.4E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Bis(2-ethylhexyl) phthalate	3.45E-11	=	[	5.5E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	5.07E-13	=	[	8.1E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Hexane	3.07E-13	=	[	4.9E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Methylene chloride	1.71E-14	=	[	2.7E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
o-Xylene	1.10E-15	=	[	1.8E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Styrene	5.60E-15	=	[	9.0E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	8.37E-15	=	[	1.3E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Xylenes (total)	3.96E-15	=	[	6.3E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
beta-BHC	2.16E-13	=	[	3.5E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Gamma-BHC (Lindane)	4.37E-14	=	[	7.0E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Aroclor-1260	1.76E-13	=	[	2.8E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method B

Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	6.76E-03	x	0.00E+00	=	0.00E+00	8.45E-02	/	1.00E+00	=	8.45E-02
Antimony	2.47E-07	x	0.00E+00	=	0.00E+00	3.09E-06	/	4.00E-04	=	7.72E-03
Arsenic	3.49E-06	x	1.50E+00	=	5.23E-06	4.36E-05	/	3.00E-04	=	1.45E-01
Barium	9.41E-05	x	0.00E+00	=	0.00E+00	1.18E-03	/	2.00E-01	=	5.88E-03
Beryllium	2.98E-07	x	0.00E+00	=	0.00E+00	3.73E-06	/	2.00E-03	=	1.86E-03
Cadmium	1.17E-07	x	0.00E+00	=	0.00E+00	1.46E-06	/	1.00E-03	=	1.46E-03
Chromium	8.98E-06	x	0.00E+00	=	0.00E+00	1.12E-04	/	3.00E-03	=	3.74E-02
Cobalt	8.18E-06	x	0.00E+00	=	0.00E+00	1.02E-04	/	3.00E-04	=	3.41E-01
Copper	1.30E-05	x	0.00E+00	=	0.00E+00	1.63E-04	/	4.00E-02	=	4.07E-03
Fluoride	2.11E-06	x	0.00E+00	=	0.00E+00	2.64E-05	/	4.00E-02	=	6.60E-04
Iron	2.39E-02	x	0.00E+00	=	0.00E+00	2.99E-01	/	7.00E-01	=	4.28E-01
Lithium	7.43E-06	x	0.00E+00	=	0.00E+00	9.28E-05	/	2.00E-03	=	4.64E-02
Manganese	3.86E-04	x	0.00E+00	=	0.00E+00	4.83E-03	/	1.40E-01	=	3.45E-02
Mercury	3.04E-08	x	0.00E+00	=	0.00E+00	3.80E-07	/	0.00E+00	=	NA
Nickel	1.13E-05	x	0.00E+00	=	0.00E+00	1.41E-04	/	2.00E-02	=	7.03E-03
Nitrate	7.15E-06	x	0.00E+00	=	0.00E+00	8.94E-05	/	7.10E+00	=	1.26E-05
Nitrite	3.06E-06	x	0.00E+00	=	0.00E+00	3.82E-05	/	3.00E-01	=	1.27E-04
Silver	8.18E-08	x	0.00E+00	=	0.00E+00	1.02E-06	/	5.00E-03	=	2.05E-04
Strontium	3.62E-05	x	0.00E+00	=	0.00E+00	4.52E-04	/	6.00E-01	=	7.54E-04
Tin	6.36E-06	x	0.00E+00	=	0.00E+00	7.95E-05	/	6.00E-01	=	1.33E-04
Total Uranium	7.15E-07	x	0.00E+00	=	0.00E+00	8.94E-06	/	3.00E-03	=	2.98E-03
Vanadium	6.97E-05	x	0.00E+00	=	0.00E+00	8.72E-04	/	5.00E-03	=	1.74E-01
Zinc	3.83E-05	x	0.00E+00	=	0.00E+00	4.79E-04	/	3.00E-01	=	1.60E-03
2-Butanone	2.48E-09	x	0.00E+00	=	0.00E+00	3.11E-08	/	6.00E-01	=	5.18E-08
Bis(2-ethylhexyl) phthalate	4.03E-06	x	1.40E-02	=	5.65E-08	5.04E-05	/	2.00E-02	=	2.52E-03
Butylbenzylphthalate	5.92E-08	x	1.90E-03	=	1.13E-10	7.40E-07	/	2.00E-01	=	3.70E-06
Hexane	3.59E-08	x	0.00E+00	=	0.00E+00	4.49E-07	/	6.00E-02	=	7.48E-06
Methylene chloride	2.00E-09	x	2.00E-03	=	4.00E-12	2.50E-08	/	6.00E-03	=	4.17E-06
o-Xylene	1.28E-10	x	0.00E+00	=	0.00E+00	1.60E-09	/	2.00E-01	=	8.00E-09
Styrene	6.54E-10	x	0.00E+00	=	0.00E+00	8.18E-09	/	2.00E-01	=	4.09E-08
Toluene	9.78E-10	x	0.00E+00	=	0.00E+00	1.22E-08	/	8.00E-02	=	1.53E-07
Xylenes (total)	4.63E-10	x	0.00E+00	=	0.00E+00	5.79E-09	/	2.00E-01	=	2.89E-08
beta-BHC	2.52E-08	x	1.80E+00	=	4.54E-08	3.16E-07	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	5.10E-09	x	1.10E+00	=	5.61E-09	6.38E-08	/	3.00E-04	=	2.13E-04
Aroclor-1260	2.06E-08	x	2.00E+00	=	4.12E-08	2.58E-07	/	0.00E+00	=	NA
			Pathway total	=	5.38E-06			Pathway total	=	1.33E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.06E-08	x	0.00E+00	=	0.00E+00	5.79E-08	/	1.43E-03	=	4.05E-05
Antimony	3.87E-13	x	0.00E+00	=	0.00E+00	2.12E-12	/	0.00E+00	=	NA
Arsenic	5.46E-12	x	1.51E+01	=	8.22E-11	2.99E-11	/	4.29E-06	=	6.97E-06
Barium	1.47E-10	x	0.00E+00	=	0.00E+00	8.06E-10	/	1.43E-04	=	5.64E-06
Beryllium	4.67E-13	x	8.40E+00	=	3.92E-12	2.55E-12	/	5.71E-06	=	4.46E-07
Cadmium	1.82E-13	x	6.30E+00	=	1.15E-12	9.98E-13	/	2.86E-06	=	3.49E-07
Chromium	1.41E-11	x	0.00E+00	=	0.00E+00	7.69E-11	/	0.00E+00	=	NA
Cobalt	1.28E-11	x	3.15E+01	=	4.04E-10	7.01E-11	/	1.71E-06	=	4.09E-05
Copper	2.04E-11	x	0.00E+00	=	0.00E+00	1.12E-10	/	0.00E+00	=	NA
Fluoride	3.31E-12	x	0.00E+00	=	0.00E+00	1.81E-11	/	3.71E-03	=	4.87E-09
Iron	3.75E-08	x	0.00E+00	=	0.00E+00	2.05E-07	/	0.00E+00	=	NA
Lithium	1.16E-11	x	0.00E+00	=	0.00E+00	6.36E-11	/	0.00E+00	=	NA
Manganese	6.05E-10	x	0.00E+00	=	0.00E+00	3.31E-09	/	1.43E-05	=	2.32E-04
Mercury	4.76E-14	x	0.00E+00	=	0.00E+00	2.60E-13	/	8.57E-05	=	3.04E-09
Nickel	1.76E-11	x	9.10E-01	=	1.60E-11	9.63E-11	/	2.57E-05	=	3.75E-06
Nitrate	1.12E-11	x	0.00E+00	=	0.00E+00	6.13E-11	/	0.00E+00	=	NA
Nitrite	4.79E-12	x	0.00E+00	=	0.00E+00	2.62E-11	/	0.00E+00	=	NA
Silver	1.28E-13	x	0.00E+00	=	0.00E+00	7.00E-13	/	0.00E+00	=	NA
Strontium	5.66E-11	x	0.00E+00	=	0.00E+00	3.10E-10	/	0.00E+00	=	NA
Tin	9.96E-12	x	0.00E+00	=	0.00E+00	5.45E-11	/	0.00E+00	=	NA
Total Uranium	1.12E-12	x	0.00E+00	=	0.00E+00	6.12E-12	/	1.14E-05	=	5.36E-07
Vanadium	1.09E-10	x	0.00E+00	=	0.00E+00	5.97E-10	/	2.86E-05	=	2.09E-05
Zinc	6.00E-11	x	0.00E+00	=	0.00E+00	3.28E-10	/	0.00E+00	=	NA
2-Butanone	3.89E-15	x	0.00E+00	=	0.00E+00	2.13E-14	/	1.43E+00	=	1.49E-14
Bis(2-ethylhexyl) phthalate	6.31E-12	x	8.40E-03	=	5.30E-14	3.45E-11	/	0.00E+00	=	NA
Butylbenzylphthalate	9.27E-14	x	0.00E+00	=	0.00E+00	5.07E-13	/	0.00E+00	=	NA
Hexane	5.62E-14	x	0.00E+00	=	0.00E+00	3.07E-13	/	2.00E-01	=	1.54E-12
Methylene chloride	3.13E-15	x	3.50E-05	=	1.10E-19	1.71E-14	/	1.71E-01	=	9.99E-14
o-Xylene	2.00E-16	x	0.00E+00	=	0.00E+00	1.10E-15	/	2.86E-02	=	3.84E-14
Styrene	1.02E-15	x	0.00E+00	=	0.00E+00	5.60E-15	/	2.86E-01	=	1.96E-14
Toluene	1.53E-15	x	0.00E+00	=	0.00E+00	8.37E-15	/	1.43E+00	=	5.86E-15
Xylenes (total)	7.25E-16	x	0.00E+00	=	0.00E+00	3.96E-15	/	2.86E-02	=	1.39E-13
beta-BHC	3.95E-14	x	1.86E+00	=	7.33E-14	2.16E-13	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	7.98E-15	x	1.09E+00	=	8.66E-15	4.37E-14	/	0.00E+00	=	NA
Aroclor-1260	3.23E-14	x	2.00E+00	=	6.43E-14	1.76E-13	/	0.00E+00	=	NA
			Pathway total =		5.07E-10			Pathway total =		3.51E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**8.5E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.7E-03	1%
Arsenic	Sum of all pathways	=	**5.23E-06**	Sum of all pathways	=	**1.5E-01**	11%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.9E-03	0%
Beryllium	Sum of all pathways	=	3.92E-12	Sum of all pathways	=	1.9E-03	0%
Cadmium	Sum of all pathways	=	1.15E-12	Sum of all pathways	=	1.5E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.7E-02**	3%
Cobalt	Sum of all pathways	=	4.04E-10	Sum of all pathways	=	**3.4E-01**	26%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.1E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.6E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.3E-01**	32%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.6E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.5E-02**	3%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-09	0%
Nickel	Sum of all pathways	=	1.60E-11	Sum of all pathways	=	7.0E-03	1%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.5E-04	0%
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.7E-01**	13%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-03	0%
2-Butanone	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-08	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	5.65E-08	Sum of all pathways	=	2.5E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.13E-10	Sum of all pathways	=	3.7E-06	0%
Hexane	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.5E-06	0%
Methylene chloride	Sum of all pathways	=	4.00E-12	Sum of all pathways	=	4.2E-06	0%
o-Xylene	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.0E-09	0%
Styrene	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.1E-08	0%
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-07	0%
Xylenes (total)	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.9E-08	0%
beta-BHC	Sum of all pathways	=	4.54E-08	Sum of all pathways	=	**NA**	
Gamma-BHC (Lindane)	Sum of all pathways	=	5.61E-09	Sum of all pathways	=	2.1E-04	0%
Aroclor-1260	Sum of all pathways	=	4.12E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.38E-06	All Pathways and Chemicals	=	**1.33E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	7.01E-03	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.56E-07	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	5.02E-06	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	9.05E-05	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	1.99E-07	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	1.37E-07	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.68E-05	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	1.02E-05	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.22E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	1.66E-06	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.61E-02	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	7.56E-06	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	4.08E-04	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Molybdenum	2.00E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.31E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	3.24E-05	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	1.30E-06	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Selenium	9.83E-07	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	6.55E-08	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.34E-05	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	5.45E-07	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	6.61E-05	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	4.48E-05	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	2.00E-07	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Di-n-butylphthalate	5.70E-07	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Styrene	3.94E-10	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	6.18E-10	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	8.76E-02	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.20E-06	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	6.27E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.13E-03	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	2.48E-06	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.72E-06	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	2.10E-04	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.27E-04	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.52E-04	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	2.07E-05	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.26E-01	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	9.45E-05	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	5.10E-03	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Molybdenum	2.50E-05	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.64E-04	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	4.06E-04	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	1.62E-05	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Selenium	1.23E-05	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	8.19E-07	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.17E-04	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	6.82E-06	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	8.27E-04	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	5.60E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	2.50E-06	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Di-n-butylphthalate	7.13E-06	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Styrene	4.92E-09	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	7.73E-09	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.10E-08	=	[	9.6E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.01E-13	=	[	3.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	7.86E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.42E-10	=	[	1.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	3.11E-13	=	[	2.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	2.15E-13	=	[	1.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	2.63E-11	=	[	2.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.59E-11	=	[	1.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	1.91E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.59E-12	=	[	2.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	4.08E-08	=	[	3.6E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.18E-11	=	[	1.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.39E-10	=	[	5.6E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.13E-12	=	[	2.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.05E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	5.08E-11	=	[	4.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	2.03E-12	=	[	1.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	1.54E-12	=	[	1.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.03E-13	=	[	9.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.23E-11	=	[	4.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	8.54E-13	=	[	7.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.04E-10	=	[	9.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.01E-11	=	[	6.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	3.13E-13	=	[	2.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Di-n-butylphthalate	8.92E-13	=	[	7.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	6.17E-16	=	[	5.4E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	9.68E-16	=	[	8.5E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	6.00E-08	=	[	9.6E-05	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.19E-12	=	[	3.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	4.30E-11	=	[	6.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	7.75E-10	=	[	1.2E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	1.70E-12	=	[	2.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	1.18E-12	=	[	1.9E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	1.44E-10	=	[	2.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	8.72E-11	=	[	1.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.04E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.42E-11	=	[	2.3E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.23E-07	=	[	3.6E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	6.48E-11	=	[	1.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.49E-09	=	[	5.6E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Molybdenum	1.71E-11	=	[	2.7E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	1.12E-10	=	[	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	2.78E-10	=	[	4.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	1.11E-11	=	[	1.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Selenium	8.41E-12	=	[	1.3E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	5.61E-13	=	[	9.0E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	2.86E-10	=	[	4.6E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	4.67E-12	=	[	7.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.66E-10	=	[	9.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.83E-10	=	[	6.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	1.71E-12	=	[	2.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Di-n-butylphthalate	4.88E-12	=	[	7.8E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Styrene	3.37E-15	=	[	5.4E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	5.29E-15	=	[	8.5E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.01E-03	x	0.00E+00	=	0.00E+00	8.76E-02	/	1.00E+00	=	8.76E-02
Antimony	2.56E-07	x	0.00E+00	=	0.00E+00	3.20E-06	/	4.00E-04	=	7.99E-03
Arsenic	5.02E-06	x	1.50E+00	=	7.53E-06	6.27E-05	/	3.00E-04	=	**2.09E-01**
Barium	9.05E-05	x	0.00E+00	=	0.00E+00	1.13E-03	/	2.00E-01	=	5.65E-03
Beryllium	1.99E-07	x	0.00E+00	=	0.00E+00	2.48E-06	/	2.00E-03	=	1.24E-03
Cadmium	1.37E-07	x	0.00E+00	=	0.00E+00	1.72E-06	/	1.00E-03	=	1.72E-03
Chromium	1.68E-05	x	0.00E+00	=	0.00E+00	2.10E-04	/	3.00E-03	=	7.00E-02
Cobalt	1.02E-05	x	0.00E+00	=	0.00E+00	1.27E-04	/	3.00E-04	=	**4.24E-01**
Copper	1.22E-05	x	0.00E+00	=	0.00E+00	1.52E-04	/	4.00E-02	=	3.81E-03
Fluoride	1.66E-06	x	0.00E+00	=	0.00E+00	2.07E-05	/	4.00E-02	=	5.18E-04
Iron	2.61E-02	x	0.00E+00	=	0.00E+00	3.26E-01	/	7.00E-01	=	**4.66E-01**
Lithium	7.56E-06	x	0.00E+00	=	0.00E+00	9.45E-05	/	2.00E-03	=	4.73E-02
Manganese	4.08E-04	x	0.00E+00	=	0.00E+00	5.10E-03	/	1.40E-01	=	3.64E-02
Molybdenum	2.00E-06	x	0.00E+00	=	0.00E+00	2.50E-05	/	5.00E-03	=	5.00E-03
Nickel	1.31E-05	x	0.00E+00	=	0.00E+00	1.64E-04	/	2.00E-02	=	8.18E-03
Nitrate	3.24E-05	x	0.00E+00	=	0.00E+00	4.06E-04	/	7.10E+00	=	5.71E-05
Nitrite	1.30E-06	x	0.00E+00	=	0.00E+00	1.62E-05	/	3.00E-01	=	5.41E-05
Selenium	9.83E-07	x	0.00E+00	=	0.00E+00	1.23E-05	/	5.00E-03	=	2.46E-03
Silver	6.55E-08	x	0.00E+00	=	0.00E+00	8.19E-07	/	5.00E-03	=	1.64E-04
Strontium	3.34E-05	x	0.00E+00	=	0.00E+00	4.17E-04	/	6.00E-01	=	6.96E-04
Total Uranium	5.45E-07	x	0.00E+00	=	0.00E+00	6.82E-06	/	3.00E-03	=	2.27E-03
Vanadium	6.61E-05	x	0.00E+00	=	0.00E+00	8.27E-04	/	5.00E-03	=	**1.65E-01**
Zinc	4.48E-05	x	0.00E+00	=	0.00E+00	5.60E-04	/	3.00E-01	=	1.87E-03
Butylbenzylphthalate	2.00E-07	x	1.90E-03	=	3.80E-10	2.50E-06	/	2.00E-01	=	1.25E-05
Di-n-butylphthalate	5.70E-07	x	0.00E+00	=	0.00E+00	7.13E-06	/	1.00E-01	=	7.13E-05
Styrene	3.94E-10	x	0.00E+00	=	0.00E+00	4.92E-09	/	2.00E-01	=	2.46E-08
Toluene	6.18E-10	x	0.00E+00	=	0.00E+00	7.73E-09	/	8.00E-02	=	9.66E-08
			Pathway total	=	7.53E-06			Pathway total	=	**1.55E+00**

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.10E-08	x	0.00E+00	=	0.00E+00	6.00E-08	/	1.43E-03	=	4.20E-05
Antimony	4.01E-13	x	0.00E+00	=	0.00E+00	2.19E-12	/	0.00E+00	=	NA
Arsenic	7.86E-12	x	1.51E+01	=	1.18E-10	4.30E-11	/	4.29E-06	=	1.00E-05
Barium	1.42E-10	x	0.00E+00	=	0.00E+00	7.75E-10	/	1.43E-04	=	5.42E-06
Beryllium	3.11E-13	x	8.40E+00	=	2.61E-12	1.70E-12	/	5.71E-06	=	2.98E-07
Cadmium	2.15E-13	x	6.30E+00	=	1.36E-12	1.18E-12	/	2.86E-06	=	4.12E-07
Chromium	2.63E-11	x	0.00E+00	=	0.00E+00	1.44E-10	/	0.00E+00	=	NA
Cobalt	1.59E-11	x	3.15E+01	=	5.02E-10	8.72E-11	/	1.71E-06	=	5.08E-05
Copper	1.91E-11	x	0.00E+00	=	0.00E+00	1.04E-10	/	0.00E+00	=	NA
Fluoride	2.59E-12	x	0.00E+00	=	0.00E+00	1.42E-11	/	3.71E-03	=	3.82E-09
Iron	4.08E-08	x	0.00E+00	=	0.00E+00	2.23E-07	/	0.00E+00	=	NA
Lithium	1.18E-11	x	0.00E+00	=	0.00E+00	6.48E-11	/	0.00E+00	=	NA
Manganese	6.39E-10	x	0.00E+00	=	0.00E+00	3.49E-09	/	1.43E-05	=	2.45E-04
Molybdenum	3.13E-12	x	0.00E+00	=	0.00E+00	1.71E-11	/	0.00E+00	=	NA
Nickel	2.05E-11	x	9.10E-01	=	1.86E-11	1.12E-10	/	2.57E-05	=	4.36E-06
Nitrate	5.08E-11	x	0.00E+00	=	0.00E+00	2.78E-10	/	0.00E+00	=	NA
Nitrite	2.03E-12	x	0.00E+00	=	0.00E+00	1.11E-11	/	0.00E+00	=	NA
Selenium	1.54E-12	x	0.00E+00	=	0.00E+00	8.41E-12	/	5.71E-03	=	1.47E-09
Silver	1.03E-13	x	0.00E+00	=	0.00E+00	5.61E-13	/	0.00E+00	=	NA
Strontium	5.23E-11	x	0.00E+00	=	0.00E+00	2.86E-10	/	0.00E+00	=	NA
Total Uranium	8.54E-13	x	0.00E+00	=	0.00E+00	4.67E-12	/	1.14E-05	=	4.09E-07
Vanadium	1.04E-10	x	0.00E+00	=	0.00E+00	5.66E-10	/	2.86E-05	=	1.98E-05
Zinc	7.01E-11	x	0.00E+00	=	0.00E+00	3.83E-10	/	0.00E+00	=	NA
Butylbenzylphthalate	3.13E-13	x	0.00E+00	=	0.00E+00	1.71E-12	/	0.00E+00	=	NA
Di-n-butylphthalate	8.92E-13	x	0.00E+00	=	0.00E+00	4.88E-12	/	0.00E+00	=	NA
Styrene	6.17E-16	x	0.00E+00	=	0.00E+00	3.37E-15	/	2.86E-01	=	1.18E-14
Toluene	9.68E-16	x	0.00E+00	=	0.00E+00	5.29E-15	/	1.43E+00	=	3.70E-15
			Pathway total =		6.43E-10			Pathway total =		3.78E-04

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**8.8E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.0E-03	1%
Arsenic	Sum of all pathways	=	**7.53E-06**	Sum of all pathways	=	**2.1E-01**	14%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.7E-03	0%
Beryllium	Sum of all pathways	=	2.61E-12	Sum of all pathways	=	1.2E-03	0%
Cadmium	Sum of all pathways	=	1.36E-12	Sum of all pathways	=	1.7E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**7.0E-02**	5%
Cobalt	Sum of all pathways	=	5.02E-10	Sum of all pathways	=	**4.2E-01**	27%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.8E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.7E-01**	30%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.7E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.7E-02**	2%
Molybdenum	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.0E-03	0%
Nickel	Sum of all pathways	=	1.86E-11	Sum of all pathways	=	8.2E-03	1%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.7E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.4E-05	0%
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.5E-03	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.0E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.3E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.7E-01**	11%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.9E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	3.80E-10	Sum of all pathways	=	1.3E-05	0%
Di-n-butylphthalate	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.1E-05	0%
Styrene	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.5E-08	0%
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.7E-08	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	7.53E-06

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.55E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation Units	CDIingestion mg/kg-day	=	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																					
Aluminum	7.74E-03	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.16E-06	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	7.89E-06	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	2.44E-04	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	3.28E-07	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Boron	4.39E-05	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	1.13E-07	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.16E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	8.27E-06	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.38E-05	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	1.53E-06	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.41E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	8.68E-06	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.83E-04	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	1.62E-08	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.37E-05	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	9.23E-06	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	2.50E-06	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	6.24E-08	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	1.25E-04	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Tin	3.60E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	6.50E-07	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	5.43E-05	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	5.23E-05	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Bis(2-ethylhexyl) phthalate	2.07E-06	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	7.78E-08	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	9.68E-02	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	2.70E-05	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	9.86E-05	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	3.05E-03	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	4.10E-06	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Boron	5.49E-04	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.41E-06	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.45E-04	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.03E-04	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.73E-04	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	1.91E-05	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.01E-01	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.09E-04	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.79E-03	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	2.03E-07	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.71E-04	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	1.15E-04	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	3.13E-05	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	7.80E-07	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	1.56E-03	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Tin	4.50E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	8.13E-06	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	6.79E-04	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	6.54E-04	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Bis(2-ethylhexyl) phthalate	2.59E-05	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	9.73E-07	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.21E-08	=	[	1.1E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.38E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	1.24E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	3.82E-10	=	[	3.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	5.14E-13	=	[	4.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	6.87E-11	=	[	6.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.77E-13	=	[	1.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.82E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.29E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.16E-11	=	[	1.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	2.40E-12	=	[	2.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.77E-08	=	[	3.3E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.36E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.00E-10	=	[	5.2E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	2.54E-14	=	[	2.2E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.14E-11	=	[	1.9E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.45E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.91E-12	=	[	3.4E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	9.77E-14	=	[	8.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	1.96E-10	=	[	1.7E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	5.64E-12	=	[	4.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.02E-12	=	[	8.9E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	8.50E-11	=	[	7.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	8.19E-11	=	[	7.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	3.24E-12	=	[	2.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.22E-13	=	[	1.1E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	6.63E-08	=	[	1.1E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	1.85E-11	=	[	3.0E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	6.76E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	2.09E-09	=	[	3.3E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	2.81E-12	=	[	4.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Boron	3.76E-10	=	[	6.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	9.67E-13	=	[	1.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	9.93E-11	=	[	1.6E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.08E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.18E-10	=	[	1.9E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.31E-11	=	[	2.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.06E-07	=	[	3.3E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.43E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.28E-09	=	[	5.2E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.39E-13	=	[	2.2E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	1.17E-10	=	[	1.9E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	7.90E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	2.14E-11	=	[	3.4E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	5.34E-13	=	[	8.5E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	1.07E-09	=	[	1.7E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Tin	3.08E-11	=	[	4.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	5.57E-12	=	[	8.9E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	4.65E-10	=	[	7.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	4.48E-10	=	[	7.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Bis(2-ethylhexyl) phthalate	1.77E-11	=	[	2.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	6.66E-13	=	[	1.1E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.74E-03	x	0.00E+00	=	0.00E+00	9.68E-02	/	1.00E+00	=	9.68E-02
Antimony	2.16E-06	x	0.00E+00	=	0.00E+00	2.70E-05	/	4.00E-04	=	6.75E-02
Arsenic	7.89E-06	x	1.50E+00	=	1.18E-05	9.86E-05	/	3.00E-04	=	**3.29E-01**
Barium	2.44E-04	x	0.00E+00	=	0.00E+00	3.05E-03	/	2.00E-01	=	1.53E-02
Beryllium	3.28E-07	x	0.00E+00	=	0.00E+00	4.10E-06	/	2.00E-03	=	2.05E-03
Boron	4.39E-05	x	0.00E+00	=	0.00E+00	5.49E-04	/	2.00E-01	=	2.74E-03
Cadmium	1.13E-07	x	0.00E+00	=	0.00E+00	1.41E-06	/	1.00E-03	=	1.41E-03
Chromium	1.16E-05	x	0.00E+00	=	0.00E+00	1.45E-04	/	3.00E-03	=	4.83E-02
Cobalt	8.27E-06	x	0.00E+00	=	0.00E+00	1.03E-04	/	3.00E-04	=	**3.45E-01**
Copper	1.38E-05	x	0.00E+00	=	0.00E+00	1.73E-04	/	4.00E-02	=	4.31E-03
Fluoride	1.53E-06	x	0.00E+00	=	0.00E+00	1.91E-05	/	4.00E-02	=	4.78E-04
Iron	2.41E-02	x	0.00E+00	=	0.00E+00	3.01E-01	/	7.00E-01	=	**4.30E-01**
Lithium	8.68E-06	x	0.00E+00	=	0.00E+00	1.09E-04	/	2.00E-03	=	5.43E-02
Manganese	3.83E-04	x	0.00E+00	=	0.00E+00	4.79E-03	/	1.40E-01	=	3.42E-02
Mercury	1.62E-08	x	0.00E+00	=	0.00E+00	2.03E-07	/	0.00E+00	=	**NA**
Nickel	1.37E-05	x	0.00E+00	=	0.00E+00	1.71E-04	/	2.00E-02	=	8.56E-03
Nitrate	9.23E-06	x	0.00E+00	=	0.00E+00	1.15E-04	/	7.10E+00	=	1.63E-05
Nitrite	2.50E-06	x	0.00E+00	=	0.00E+00	3.13E-05	/	3.00E-01	=	1.04E-04
Silver	6.24E-08	x	0.00E+00	=	0.00E+00	7.80E-07	/	5.00E-03	=	1.56E-04
Strontium	1.25E-04	x	0.00E+00	=	0.00E+00	1.56E-03	/	6.00E-01	=	2.60E-03
Tin	3.60E-06	x	0.00E+00	=	0.00E+00	4.50E-05	/	6.00E-01	=	7.50E-05
Total Uranium	6.50E-07	x	0.00E+00	=	0.00E+00	8.13E-06	/	3.00E-03	=	2.71E-03
Vanadium	5.43E-05	x	0.00E+00	=	0.00E+00	6.79E-04	/	5.00E-03	=	**1.36E-01**
Zinc	5.23E-05	x	0.00E+00	=	0.00E+00	6.54E-04	/	3.00E-01	=	2.18E-03
Bis(2-ethylhexyl) phthalate	2.07E-06	x	1.40E-02	=	2.90E-08	2.59E-05	/	2.00E-02	=	1.29E-03
Butylbenzylphthalate	7.78E-08	x	1.90E-03	=	1.48E-10	9.73E-07	/	2.00E-01	=	4.86E-06
			Pathway total	=	1.19E-05			Pathway total	=	**1.58E+00**

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.21E-08	x	0.00E+00	=	0.00E+00	6.63E-08	/	1.43E-03	=	4.64E-05
Antimony	3.38E-12	x	0.00E+00	=	0.00E+00	1.85E-11	/	0.00E+00	=	NA
Arsenic	1.24E-11	x	1.51E+01	=	1.86E-10	6.76E-11	/	4.29E-06	=	1.58E-05
Barium	3.82E-10	x	0.00E+00	=	0.00E+00	2.09E-09	/	1.43E-04	=	1.46E-05
Beryllium	5.14E-13	x	8.40E+00	=	4.31E-12	2.81E-12	/	5.71E-06	=	4.91E-07
Boron	6.87E-11	x	0.00E+00	=	0.00E+00	3.76E-10	/	5.71E-03	=	6.58E-08
Cadmium	1.77E-13	x	6.30E+00	=	1.11E-12	9.67E-13	/	2.86E-06	=	3.39E-07
Chromium	1.82E-11	x	0.00E+00	=	0.00E+00	9.93E-11	/	0.00E+00	=	NA
Cobalt	1.29E-11	x	3.15E+01	=	4.08E-10	7.08E-11	/	1.71E-06	=	4.13E-05
Copper	2.16E-11	x	0.00E+00	=	0.00E+00	1.18E-10	/	0.00E+00	=	NA
Fluoride	2.40E-12	x	0.00E+00	=	0.00E+00	1.31E-11	/	3.71E-03	=	3.53E-09
Iron	3.77E-08	x	0.00E+00	=	0.00E+00	2.06E-07	/	0.00E+00	=	NA
Lithium	1.36E-11	x	0.00E+00	=	0.00E+00	7.43E-11	/	0.00E+00	=	NA
Manganese	6.00E-10	x	0.00E+00	=	0.00E+00	3.28E-09	/	1.43E-05	=	2.30E-04
Mercury	2.54E-14	x	0.00E+00	=	0.00E+00	1.39E-13	/	8.57E-05	=	1.62E-09
Nickel	2.14E-11	x	9.10E-01	=	1.95E-11	1.17E-10	/	2.57E-05	=	4.56E-06
Nitrate	1.45E-11	x	0.00E+00	=	0.00E+00	7.90E-11	/	0.00E+00	=	NA
Nitrite	3.91E-12	x	0.00E+00	=	0.00E+00	2.14E-11	/	0.00E+00	=	NA
Silver	9.77E-14	x	0.00E+00	=	0.00E+00	5.34E-13	/	0.00E+00	=	NA
Strontium	1.96E-10	x	0.00E+00	=	0.00E+00	1.07E-09	/	0.00E+00	=	NA
Tin	5.64E-12	x	0.00E+00	=	0.00E+00	3.08E-11	/	0.00E+00	=	NA
Total Uranium	1.02E-12	x	0.00E+00	=	0.00E+00	5.57E-12	/	1.14E-05	=	4.87E-07
Vanadium	8.50E-11	x	0.00E+00	=	0.00E+00	4.65E-10	/	2.86E-05	=	1.63E-05
Zinc	8.19E-11	x	0.00E+00	=	0.00E+00	4.48E-10	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	3.24E-12	x	8.40E-03	=	2.72E-14	1.77E-11	/	0.00E+00	=	NA
Butylbenzylphthalate	1.22E-13	x	0.00E+00	=	0.00E+00	6.66E-13	/	0.00E+00	=	NA
			Pathway total =		6.19E-10			Pathway total =		3.70E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**9.7E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	**6.8E-02**	4%
Arsenic	Sum of all pathways	=	**1.18E-05**	Sum of all pathways	=	**3.3E-01**	21%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.5E-02	1%
Beryllium	Sum of all pathways	=	4.31E-12	Sum of all pathways	=	2.1E-03	0%
Boron	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.7E-03	0%
Cadmium	Sum of all pathways	=	1.11E-12	Sum of all pathways	=	1.4E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.8E-02**	3%
Cobalt	Sum of all pathways	=	4.08E-10	Sum of all pathways	=	**3.4E-01**	22%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.3E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.8E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.3E-01**	27%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.4E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.4E-02**	2%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-09	0%
Nickel	Sum of all pathways	=	1.95E-11	Sum of all pathways	=	8.6E-03	1%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.0E-04	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.6E-03	0%
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.5E-05	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.7E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.4E-01**	9%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.2E-03	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.90E-08	Sum of all pathways	=	1.3E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.48E-10	Sum of all pathways	=	4.9E-06	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.19E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**1.58E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-06 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	6.40E-03	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.69E-07	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	3.60E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	8.34E-05	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	1.64E-07	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	9.56E-08	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	9.68E-06	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	8.26E-06	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.22E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	1.26E-06	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.11E-02	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	7.07E-06	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.56E-04	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	1.71E-08	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Molybdenum	2.45E-06	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.31E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	7.68E-06	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	3.10E-06	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Selenium	1.35E-06	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	9.40E-08	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.10E-05	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	6.88E-07	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	5.91E-05	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	3.80E-05	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Acetone	4.62E-08	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
1-Butanol	2.22E-08	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Bis(2-ethylhexyl) phthalate	1.84E-06	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	5.92E-08	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Hexane	6.05E-08	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
beta-BHC	2.27E-08	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	8.00E-02	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.37E-06	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	4.50E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.04E-03	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	2.05E-06	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.20E-06	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.21E-04	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.03E-04	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.52E-04	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	1.58E-05	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	2.63E-01	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	8.84E-05	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.45E-03	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	2.14E-07	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Molybdenum	3.06E-05	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.64E-04	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	9.60E-05	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	3.87E-05	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Selenium	1.69E-05	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	1.17E-06	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	3.88E-04	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	8.60E-06	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	7.39E-04	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	4.75E-04	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Acetone	5.78E-07	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
1-Butanol	2.78E-07	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Bis(2-ethylhexyl) phthalate	2.30E-05	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	7.40E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Hexane	7.56E-07	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
beta-BHC	2.83E-07	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.00E-08	=	[	8.8E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.22E-13	=	[	3.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	5.63E-12	=	[	4.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.31E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	2.57E-13	=	[	2.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.50E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.52E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.29E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	1.91E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	1.98E-12	=	[	1.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.30E-08	=	[	2.9E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.11E-11	=	[	9.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.57E-10	=	[	4.9E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	2.68E-14	=	[	2.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.84E-12	=	[	3.4E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	2.06E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.20E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	4.85E-12	=	[	4.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	2.11E-12	=	[	1.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.47E-13	=	[	1.3E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	4.85E-11	=	[	4.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.08E-12	=	[	9.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	9.25E-11	=	[	8.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	5.95E-11	=	[	5.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	7.23E-14	=	[	6.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
1-Butanol	3.48E-14	=	[	3.0E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	2.88E-12	=	[	2.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	9.27E-14	=	[	8.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Hexane	9.47E-14	=	[	8.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	3.55E-14	=	[	3.1E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	5.48E-08	=	[	8.8E-05	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.31E-12	=	[	3.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	3.08E-11	=	[	4.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	7.14E-10	=	[	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	1.40E-12	=	[	2.2E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	8.19E-13	=	[	1.3E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	8.29E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.07E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.04E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.08E-11	=	[	1.7E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	1.80E-07	=	[	2.9E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	6.05E-11	=	[	9.7E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.05E-09	=	[	4.9E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.46E-13	=	[	2.3E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Molybdenum	2.10E-11	=	[	3.4E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	1.12E-10	=	[	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	6.58E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	2.65E-11	=	[	4.2E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Selenium	1.16E-11	=	[	1.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	8.05E-13	=	[	1.3E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	2.65E-10	=	[	4.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	5.89E-12	=	[	9.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.06E-10	=	[	8.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.25E-10	=	[	5.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Acetone	3.96E-13	=	[	6.3E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
1-Butanol	1.90E-13	=	[	3.0E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Bis(2-ethylhexyl) phthalate	1.58E-11	=	[	2.5E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	5.07E-13	=	[	8.1E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Hexane	5.18E-13	=	[	8.3E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
beta-BHC	1.94E-13	=	[	3.1E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	6.40E-03	x	0.00E+00	=	0.00E+00	8.00E-02	/	1.00E+00	=	8.00E-02
Antimony	2.69E-07	x	0.00E+00	=	0.00E+00	3.37E-06	/	4.00E-04	=	8.42E-03
Arsenic	3.60E-06	x	1.50E+00	=	5.40E-06	4.50E-05	/	3.00E-04	=	1.50E-01
Barium	8.34E-05	x	0.00E+00	=	0.00E+00	1.04E-03	/	2.00E-01	=	5.22E-03
Beryllium	1.64E-07	x	0.00E+00	=	0.00E+00	2.05E-06	/	2.00E-03	=	1.02E-03
Cadmium	9.56E-08	x	0.00E+00	=	0.00E+00	1.20E-06	/	1.00E-03	=	1.20E-03
Chromium	9.68E-06	x	0.00E+00	=	0.00E+00	1.21E-04	/	3.00E-03	=	4.03E-02
Cobalt	8.26E-06	x	0.00E+00	=	0.00E+00	1.03E-04	/	3.00E-04	=	3.44E-01
Copper	1.22E-05	x	0.00E+00	=	0.00E+00	1.52E-04	/	4.00E-02	=	3.80E-03
Fluoride	1.26E-06	x	0.00E+00	=	0.00E+00	1.58E-05	/	4.00E-02	=	3.95E-04
Iron	2.11E-02	x	0.00E+00	=	0.00E+00	2.63E-01	/	7.00E-01	=	3.76E-01
Lithium	7.07E-06	x	0.00E+00	=	0.00E+00	8.84E-05	/	2.00E-03	=	4.42E-02
Manganese	3.56E-04	x	0.00E+00	=	0.00E+00	4.45E-03	/	1.40E-01	=	3.18E-02
Mercury	1.71E-08	x	0.00E+00	=	0.00E+00	2.14E-07	/	0.00E+00	=	NA
Molybdenum	2.45E-06	x	0.00E+00	=	0.00E+00	3.06E-05	/	5.00E-03	=	6.13E-03
Nickel	1.31E-05	x	0.00E+00	=	0.00E+00	1.64E-04	/	2.00E-02	=	8.21E-03
Nitrate	7.68E-06	x	0.00E+00	=	0.00E+00	9.60E-05	/	7.10E+00	=	1.35E-05
Nitrite	3.10E-06	x	0.00E+00	=	0.00E+00	3.87E-05	/	3.00E-01	=	1.29E-04
Selenium	1.35E-06	x	0.00E+00	=	0.00E+00	1.69E-05	/	5.00E-03	=	3.38E-03
Silver	9.40E-08	x	0.00E+00	=	0.00E+00	1.17E-06	/	5.00E-03	=	2.35E-04
Strontium	3.10E-05	x	0.00E+00	=	0.00E+00	3.88E-04	/	6.00E-01	=	6.46E-04
Total Uranium	6.88E-07	x	0.00E+00	=	0.00E+00	8.60E-06	/	3.00E-03	=	2.87E-03
Vanadium	5.91E-05	x	0.00E+00	=	0.00E+00	7.39E-04	/	5.00E-03	=	1.48E-01
Zinc	3.80E-05	x	0.00E+00	=	0.00E+00	4.75E-04	/	3.00E-01	=	1.58E-03
Acetone	4.62E-08	x	0.00E+00	=	0.00E+00	5.78E-07	/	9.00E-01	=	6.42E-07
1-Butanol	2.22E-08	x	0.00E+00	=	0.00E+00	2.78E-07	/	1.00E-01	=	2.78E-06
Bis(2-ethylhexyl) phthalate	1.84E-06	x	1.40E-02	=	2.58E-08	2.30E-05	/	2.00E-02	=	1.15E-03
Butylbenzylphthalate	5.92E-08	x	1.90E-03	=	1.12E-10	7.40E-07	/	2.00E-01	=	3.70E-06
Hexane	6.05E-08	x	0.00E+00	=	0.00E+00	7.56E-07	/	6.00E-02	=	1.26E-05
beta-BHC	2.27E-08	x	1.80E+00	=	4.08E-08	2.83E-07	/	0.00E+00	=	NA
			Pathway total	=	5.47E-06			Pathway total	=	1.26E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.00E-08	x	0.00E+00	=	0.00E+00	5.48E-08	/	1.43E-03	=	3.83E-05
Antimony	4.22E-13	x	0.00E+00	=	0.00E+00	2.31E-12	/	0.00E+00	=	NA
Arsenic	5.63E-12	x	1.51E+01	=	8.48E-11	3.08E-11	/	4.29E-06	=	7.19E-06
Barium	1.31E-10	x	0.00E+00	=	0.00E+00	7.14E-10	/	1.43E-04	=	5.00E-06
Beryllium	2.57E-13	x	8.40E+00	=	2.16E-12	1.40E-12	/	5.71E-06	=	2.46E-07
Cadmium	1.50E-13	x	6.30E+00	=	9.43E-13	8.19E-13	/	2.86E-06	=	2.87E-07
Chromium	1.52E-11	x	0.00E+00	=	0.00E+00	8.29E-11	/	0.00E+00	=	NA
Cobalt	1.29E-11	x	3.15E+01	=	4.07E-10	7.07E-11	/	1.71E-06	=	4.13E-05
Copper	1.91E-11	x	0.00E+00	=	0.00E+00	1.04E-10	/	0.00E+00	=	NA
Fluoride	1.98E-12	x	0.00E+00	=	0.00E+00	1.08E-11	/	3.71E-03	=	2.91E-09
Iron	3.30E-08	x	0.00E+00	=	0.00E+00	1.80E-07	/	0.00E+00	=	NA
Lithium	1.11E-11	x	0.00E+00	=	0.00E+00	6.05E-11	/	0.00E+00	=	NA
Manganese	5.57E-10	x	0.00E+00	=	0.00E+00	3.05E-09	/	1.43E-05	=	2.13E-04
Mercury	2.68E-14	x	0.00E+00	=	0.00E+00	1.46E-13	/	8.57E-05	=	1.71E-09
Molybdenum	3.84E-12	x	0.00E+00	=	0.00E+00	2.10E-11	/	0.00E+00	=	NA
Nickel	2.06E-11	x	9.10E-01	=	1.87E-11	1.12E-10	/	2.57E-05	=	4.37E-06
Nitrate	1.20E-11	x	0.00E+00	=	0.00E+00	6.58E-11	/	0.00E+00	=	NA
Nitrite	4.85E-12	x	0.00E+00	=	0.00E+00	2.65E-11	/	0.00E+00	=	NA
Selenium	2.11E-12	x	0.00E+00	=	0.00E+00	1.16E-11	/	5.71E-03	=	2.02E-09
Silver	1.47E-13	x	0.00E+00	=	0.00E+00	8.05E-13	/	0.00E+00	=	NA
Strontium	4.85E-11	x	0.00E+00	=	0.00E+00	2.65E-10	/	0.00E+00	=	NA
Total Uranium	1.08E-12	x	0.00E+00	=	0.00E+00	5.89E-12	/	1.14E-05	=	5.15E-07
Vanadium	9.25E-11	x	0.00E+00	=	0.00E+00	5.06E-10	/	2.86E-05	=	1.77E-05
Zinc	5.95E-11	x	0.00E+00	=	0.00E+00	3.25E-10	/	0.00E+00	=	NA
Acetone	7.23E-14	x	0.00E+00	=	0.00E+00	3.96E-13	/	8.86E+00	=	4.47E-14
1-Butanol	3.48E-14	x	0.00E+00	=	0.00E+00	1.90E-13	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	2.88E-12	x	8.40E-03	=	2.42E-14	1.58E-11	/	0.00E+00	=	NA
Butylbenzylphthalate	9.27E-14	x	0.00E+00	=	0.00E+00	5.07E-13	/	0.00E+00	=	NA
Hexane	9.47E-14	x	0.00E+00	=	0.00E+00	5.18E-13	/	2.00E-01	=	2.59E-12
beta-BHC	3.55E-14	x	1.86E+00	=	6.58E-14	1.94E-13	/	0.00E+00	=	NA
			Pathway total =		5.14E-10			Pathway total =		3.28E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**8.0E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.4E-03	1%
Arsenic	Sum of all pathways	=	**5.40E-06**	Sum of all pathways	=	**1.5E-01**	12%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.2E-03	0%
Beryllium	Sum of all pathways	=	2.16E-12	Sum of all pathways	=	1.0E-03	0%
Cadmium	Sum of all pathways	=	9.43E-13	Sum of all pathways	=	1.2E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.0E-02**	3%
Cobalt	Sum of all pathways	=	4.07E-10	Sum of all pathways	=	**3.4E-01**	27%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.8E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.9E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.8E-01**	30%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.4E-02**	4%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.2E-02**	3%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-09	0%
Molybdenum	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.1E-03	0%
Nickel	Sum of all pathways	=	1.87E-11	Sum of all pathways	=	8.2E-03	1%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-04	0%
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.4E-03	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.3E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.5E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.9E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.5E-01**	12%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.6E-03	0%
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.4E-07	0%
1-Butanol	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.8E-06	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	2.58E-08	Sum of all pathways	=	1.2E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	1.12E-10	Sum of all pathways	=	3.7E-06	0%
Hexane	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-05	0%
beta-BHC	Sum of all pathways	=	4.08E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk All Pathways and Chemicals	=	5.47E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.26E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation Units	CDIingestion = mg/kg-day	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																				
Aluminum	7.13E-03	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.35E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	5.06E-06	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	8.15E-05	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	2.76E-07	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	1.21E-07	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.24E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	9.16E-06	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.28E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	2.87E-06	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.53E-02	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	8.37E-06	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.64E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	1.92E-08	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.11E-05	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	1.14E-05	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	4.61E-06	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	1.77E-07	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.31E-05	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Tin	1.44E-05	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	1.57E-06	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	7.78E-05	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	1.83E-04	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Acetone	9.80E-09	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Bis(2-ethylhexyl) phthalate	2.30E-06	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Di-n-butylphthalate	8.63E-07	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Methylene chloride	1.34E-09	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	2.94E-10	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
beta-BHC	2.58E-08	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Aroclor-1260	2.68E-08	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation Units	CDIingestion = mg/kg-day		[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF days/year	x	ED years	]	/	[	ABW kg	x	AT days	]

NONCARCINOGENIC EFFECTS

Aluminum	8.91E-02	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	2.94E-06	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	6.33E-05	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.02E-03	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	3.45E-06	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	1.51E-06	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.55E-04	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.14E-04	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.60E-04	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	3.59E-05	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.16E-01	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.05E-04	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.55E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	2.40E-07	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.39E-04	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	1.43E-04	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	5.76E-05	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	2.22E-06	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.14E-04	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Tin	1.80E-04	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	1.96E-05	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	9.72E-04	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	2.29E-03	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Acetone	1.23E-07	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Bis(2-ethylhexyl) phthalate	2.88E-05	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Di-n-butylphthalate	1.08E-05	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Methylene chloride	1.68E-08	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	3.68E-09	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
beta-BHC	3.23E-07	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Aroclor-1260	3.35E-07	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.12E-08	=	[	9.8E-05	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.68E-13	=	[	3.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	7.93E-12	=	[	6.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.28E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	4.32E-13	=	[	3.8E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	1.89E-13	=	[	1.7E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.94E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.43E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.00E-11	=	[	1.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	4.50E-12	=	[	3.9E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.96E-08	=	[	3.5E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.31E-11	=	[	1.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.70E-10	=	[	5.0E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.01E-14	=	[	2.6E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.74E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.79E-11	=	[	1.6E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	7.21E-12	=	[	6.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	2.78E-13	=	[	2.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.19E-11	=	[	4.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Tin	2.25E-11	=	[	2.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	2.46E-12	=	[	2.1E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.22E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	2.87E-10	=	[	2.5E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	1.53E-14	=	[	1.3E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Bis(2-ethylhexyl) phthalate	3.60E-12	=	[	3.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Di-n-butylphthalate	1.35E-12	=	[	1.2E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Methylene chloride	2.10E-15	=	[	1.8E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	4.60E-16	=	[	4.0E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
beta-BHC	4.04E-14	=	[	3.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Aroclor-1260	4.20E-14	=	[	3.7E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	6.10E-08	=	[	9.8E-05	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.01E-12	=	[	3.2E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	4.34E-11	=	[	6.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	6.98E-10	=	[	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	2.36E-12	=	[	3.8E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	1.03E-12	=	[	1.7E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	1.06E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.84E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.09E-10	=	[	1.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	2.46E-11	=	[	3.9E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.17E-07	=	[	3.5E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.16E-11	=	[	1.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.12E-09	=	[	5.0E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.64E-13	=	[	2.6E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	9.51E-11	=	[	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	9.79E-11	=	[	1.6E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	3.95E-11	=	[	6.3E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	1.52E-12	=	[	2.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	2.84E-10	=	[	4.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Tin	1.23E-10	=	[	2.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	1.34E-11	=	[	2.1E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	6.66E-10	=	[	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	1.57E-09	=	[	2.5E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Acetone	8.39E-14	=	[	1.3E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Bis(2-ethylhexyl) phthalate	1.97E-11	=	[	3.2E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Di-n-butylphthalate	7.39E-12	=	[	1.2E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Methylene chloride	1.15E-14	=	[	1.8E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	2.52E-15	=	[	4.0E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
beta-BHC	2.21E-13	=	[	3.5E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Aroclor-1260	2.29E-13	=	[	3.7E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	7.13E-03	x	0.00E+00	=	0.00E+00	8.91E-02	/	1.00E+00	=	8.91E-02
Antimony	2.35E-07	x	0.00E+00	=	0.00E+00	2.94E-06	/	4.00E-04	=	7.35E-03
Arsenic	5.06E-06	x	1.50E+00	=	7.60E-06	6.33E-05	/	3.00E-04	=	2.11E-01
Barium	8.15E-05	x	0.00E+00	=	0.00E+00	1.02E-03	/	2.00E-01	=	5.09E-03
Beryllium	2.76E-07	x	0.00E+00	=	0.00E+00	3.45E-06	/	2.00E-03	=	1.73E-03
Cadmium	1.21E-07	x	0.00E+00	=	0.00E+00	1.51E-06	/	1.00E-03	=	1.51E-03
Chromium	1.24E-05	x	0.00E+00	=	0.00E+00	1.55E-04	/	3.00E-03	=	5.17E-02
Cobalt	9.16E-06	x	0.00E+00	=	0.00E+00	1.14E-04	/	3.00E-04	=	3.82E-01
Copper	1.28E-05	x	0.00E+00	=	0.00E+00	1.60E-04	/	4.00E-02	=	3.99E-03
Fluoride	2.87E-06	x	0.00E+00	=	0.00E+00	3.59E-05	/	4.00E-02	=	8.98E-04
Iron	2.53E-02	x	0.00E+00	=	0.00E+00	3.16E-01	/	7.00E-01	=	4.52E-01
Lithium	8.37E-06	x	0.00E+00	=	0.00E+00	1.05E-04	/	2.00E-03	=	5.23E-02
Manganese	3.64E-04	x	0.00E+00	=	0.00E+00	4.55E-03	/	1.40E-01	=	3.25E-02
Mercury	1.92E-08	x	0.00E+00	=	0.00E+00	2.40E-07	/	0.00E+00	=	NA
Nickel	1.11E-05	x	0.00E+00	=	0.00E+00	1.39E-04	/	2.00E-02	=	6.94E-03
Nitrate	1.14E-05	x	0.00E+00	=	0.00E+00	1.43E-04	/	7.10E+00	=	2.01E-05
Nitrite	4.61E-06	x	0.00E+00	=	0.00E+00	5.76E-05	/	3.00E-01	=	1.92E-04
Silver	1.77E-07	x	0.00E+00	=	0.00E+00	2.22E-06	/	5.00E-03	=	4.44E-04
Strontium	3.31E-05	x	0.00E+00	=	0.00E+00	4.14E-04	/	6.00E-01	=	6.90E-04
Tin	1.44E-05	x	0.00E+00	=	0.00E+00	1.80E-04	/	6.00E-01	=	3.00E-04
Total Uranium	1.57E-06	x	0.00E+00	=	0.00E+00	1.96E-05	/	3.00E-03	=	6.53E-03
Vanadium	7.78E-05	x	0.00E+00	=	0.00E+00	9.72E-04	/	5.00E-03	=	1.94E-01
Zinc	1.83E-04	x	0.00E+00	=	0.00E+00	2.29E-03	/	3.00E-01	=	7.64E-03
Acetone	9.80E-09	x	0.00E+00	=	0.00E+00	1.23E-07	/	9.00E-01	=	1.36E-07
Bis(2-ethylhexyl) phthalate	2.30E-06	x	1.40E-02	=	3.22E-08	2.88E-05	/	2.00E-02	=	1.44E-03
Di-n-butylphthalate	8.63E-07	x	0.00E+00	=	0.00E+00	1.08E-05	/	1.00E-01	=	1.08E-04
Methylene chloride	1.34E-09	x	2.00E-03	=	2.68E-12	1.68E-08	/	6.00E-03	=	2.79E-06
Toluene	2.94E-10	x	0.00E+00	=	0.00E+00	3.68E-09	/	8.00E-02	=	4.59E-08
beta-BHC	2.58E-08	x	1.80E+00	=	4.64E-08	3.23E-07	/	0.00E+00	=	NA
Aroclor-1260	2.68E-08	x	2.00E+00	=	5.36E-08	3.35E-07	/	0.00E+00	=	NA
			Pathway total	=	7.73E-06			Pathway total	=	1.51E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.12E-08	x	0.00E+00	=	0.00E+00	6.10E-08	/	1.43E-03	=	4.27E-05
Antimony	3.68E-13	x	0.00E+00	=	0.00E+00	2.01E-12	/	0.00E+00	=	NA
Arsenic	7.93E-12	x	1.51E+01	=	1.19E-10	4.34E-11	/	4.29E-06	=	1.01E-05
Barium	1.28E-10	x	0.00E+00	=	0.00E+00	6.98E-10	/	1.43E-04	=	4.88E-06
Beryllium	4.32E-13	x	8.40E+00	=	3.63E-12	2.36E-12	/	5.71E-06	=	4.14E-07
Cadmium	1.89E-13	x	6.30E+00	=	1.19E-12	1.03E-12	/	2.86E-06	=	3.62E-07
Chromium	1.94E-11	x	0.00E+00	=	0.00E+00	1.06E-10	/	0.00E+00	=	NA
Cobalt	1.43E-11	x	3.15E+01	=	4.52E-10	7.84E-11	/	1.71E-06	=	4.57E-05
Copper	2.00E-11	x	0.00E+00	=	0.00E+00	1.09E-10	/	0.00E+00	=	NA
Fluoride	4.50E-12	x	0.00E+00	=	0.00E+00	2.46E-11	/	3.71E-03	=	6.62E-09
Iron	3.96E-08	x	0.00E+00	=	0.00E+00	2.17E-07	/	0.00E+00	=	NA
Lithium	1.31E-11	x	0.00E+00	=	0.00E+00	7.16E-11	/	0.00E+00	=	NA
Manganese	5.70E-10	x	0.00E+00	=	0.00E+00	3.12E-09	/	1.43E-05	=	2.18E-04
Mercury	3.01E-14	x	0.00E+00	=	0.00E+00	1.64E-13	/	8.57E-05	=	1.92E-09
Nickel	1.74E-11	x	9.10E-01	=	1.58E-11	9.51E-11	/	2.57E-05	=	3.70E-06
Nitrate	1.79E-11	x	0.00E+00	=	0.00E+00	9.79E-11	/	0.00E+00	=	NA
Nitrite	7.21E-12	x	0.00E+00	=	0.00E+00	3.95E-11	/	0.00E+00	=	NA
Silver	2.78E-13	x	0.00E+00	=	0.00E+00	1.52E-12	/	0.00E+00	=	NA
Strontium	5.19E-11	x	0.00E+00	=	0.00E+00	2.84E-10	/	0.00E+00	=	NA
Tin	2.25E-11	x	0.00E+00	=	0.00E+00	1.23E-10	/	0.00E+00	=	NA
Total Uranium	2.46E-12	x	0.00E+00	=	0.00E+00	1.34E-11	/	1.14E-05	=	1.17E-06
Vanadium	1.22E-10	x	0.00E+00	=	0.00E+00	6.66E-10	/	2.86E-05	=	2.33E-05
Zinc	2.87E-10	x	0.00E+00	=	0.00E+00	1.57E-09	/	0.00E+00	=	NA
Acetone	1.53E-14	x	0.00E+00	=	0.00E+00	8.39E-14	/	8.86E+00	=	9.48E-15
Bis(2-ethylhexyl) phthalate	3.60E-12	x	8.40E-03	=	3.02E-14	1.97E-11	/	0.00E+00	=	NA
Di-n-butylphthalate	1.35E-12	x	0.00E+00	=	0.00E+00	7.39E-12	/	0.00E+00	=	NA
Methylene chloride	2.10E-15	x	3.50E-05	=	7.34E-20	1.15E-14	/	1.71E-01	=	6.69E-14
Toluene	4.60E-16	x	0.00E+00	=	0.00E+00	2.52E-15	/	1.43E+00	=	1.76E-15
beta-BHC	4.04E-14	x	1.86E+00	=	7.49E-14	2.21E-13	/	0.00E+00	=	NA
Aroclor-1260	4.20E-14	x	2.00E+00	=	8.37E-14	2.29E-13	/	0.00E+00	=	NA
			Pathway total =		5.92E-10			Pathway total =		3.51E-04

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**8.9E-02**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.4E-03	0%
Arsenic	Sum of all pathways	=	**7.60E-06**	Sum of all pathways	=	**2.1E-01**	14%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.1E-03	0%
Beryllium	Sum of all pathways	=	3.63E-12	Sum of all pathways	=	1.7E-03	0%
Cadmium	Sum of all pathways	=	1.19E-12	Sum of all pathways	=	1.5E-03	0%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.2E-02**	3%
Cobalt	Sum of all pathways	=	4.52E-10	Sum of all pathways	=	**3.8E-01**	25%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.0E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.0E-04	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.5E-01**	30%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.2E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.3E-02**	2%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.9E-09	0%
Nickel	Sum of all pathways	=	1.58E-11	Sum of all pathways	=	6.9E-03	0%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.9E-04	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.4E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.9E-04	0%
Tin	Sum of all pathways	=	**NA**	Sum of all pathways	=	3.0E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.5E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.9E-01**	13%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.6E-03	1%
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.4E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	3.22E-08	Sum of all pathways	=	1.4E-03	0%
Di-n-butylphthalate	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-04	0%
Methylene chloride	Sum of all pathways	=	2.68E-12	Sum of all pathways	=	2.8E-06	0%
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.6E-08	0%
beta-BHC	Sum of all pathways	=	4.64E-08	Sum of all pathways	=	**NA**	
Aroclor-1260	Sum of all pathways	=	5.36E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk			Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	7.73E-06	All Pathways and Chemicals	=	**1.51E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation Units	CDIingestion mg/kg-day	=	[	CS mg/kg	x	SIR mg soil/day	x	ABI unitless	x	UCF kg/mg	x	EF unitless	x	ED years	]	/	[	ABW kg	x	AT years	]
CARCINOGENIC EFFECTS																					
Aluminum	8.39E-03	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.45E-07	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	5.83E-06	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	7.92E-05	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	1.75E-07	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cadmium	3.47E-06	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.12E-05	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	1.05E-05	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.48E-05	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	3.53E-06	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.59E-02	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	9.05E-06	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	4.09E-04	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	1.35E-08	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	1.10E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	3.97E-05	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	5.31E-06	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Selenium	7.01E-07	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Silver	6.94E-08	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	3.73E-05	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	6.60E-07	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	6.42E-05	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	4.86E-05	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Acetone	6.40E-09	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Butylbenzylphthalate	1.07E-07	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
2-Hexanone	2.77E-09	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Methylene chloride	1.40E-09	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	5.92E-10	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

NONCARCINOGENIC EFFECTS

Aluminum	1.05E-01	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.06E-06	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	7.29E-05	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	9.90E-04	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	2.19E-06	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cadmium	4.34E-05	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.40E-04	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.31E-04	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.85E-04	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	4.41E-05	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	3.24E-01	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.13E-04	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	5.11E-03	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	1.69E-07	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.38E-04	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	4.96E-04	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	6.64E-05	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Selenium	8.76E-06	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Silver	8.68E-07	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	4.66E-04	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	8.25E-06	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	8.03E-04	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	6.08E-04	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Acetone	8.00E-08	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Butylbenzylphthalate	1.34E-06	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
2-Hexanone	3.46E-08	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Methylene chloride	1.75E-08	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	7.40E-09	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m³		unitless		m³/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.31E-08	=	[	1.1E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	3.84E-13	=	[	3.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	9.13E-12	=	[	8.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.24E-10	=	[	1.1E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	2.74E-13	=	[	2.4E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cadmium	5.43E-12	=	[	4.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.75E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.64E-11	=	[	1.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.32E-11	=	[	2.0E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	5.53E-12	=	[	4.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	4.05E-08	=	[	3.5E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.42E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	6.40E-10	=	[	5.6E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	2.11E-14	=	[	1.8E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.72E-11	=	[	1.5E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	6.22E-11	=	[	5.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	8.31E-12	=	[	7.3E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	1.10E-12	=	[	9.6E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Silver	1.09E-13	=	[	9.5E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	5.84E-11	=	[	5.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	1.03E-12	=	[	9.0E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	1.01E-10	=	[	8.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.61E-11	=	[	6.7E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	1.00E-14	=	[	8.8E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Butylbenzylphthalate	1.68E-13	=	[	1.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
2-Hexanone	4.34E-15	=	[	3.8E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Methylene chloride	2.19E-15	=	[	1.9E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	9.27E-16	=	[	8.1E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	

NONCARCINOGENIC EFFECTS

Aluminum	7.18E-08	=	[	1.1E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.10E-12	=	[	3.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	4.99E-11	=	[	8.0E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	6.78E-10	=	[	1.1E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	1.50E-12	=	[	2.4E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cadmium	2.97E-11	=	[	4.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	9.59E-11	=	[	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	8.99E-11	=	[	1.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.27E-10	=	[	2.0E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	3.02E-11	=	[	4.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	2.22E-07	=	[	3.5E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.75E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.50E-09	=	[	5.6E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.16E-13	=	[	1.8E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	9.42E-11	=	[	1.5E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	3.40E-10	=	[	5.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	4.55E-11	=	[	7.3E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Selenium	6.00E-12	=	[	9.6E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Silver	5.94E-13	=	[	9.5E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	3.19E-10	=	[	5.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	5.65E-12	=	[	9.0E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	5.50E-10	=	[	8.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	4.16E-10	=	[	6.7E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Acetone	5.48E-14	=	[	8.8E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Butylbenzylphthalate	9.16E-13	=	[	1.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
2-Hexanone	2.37E-14	=	[	3.8E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Methylene chloride	1.20E-14	=	[	1.9E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	5.07E-15	=	[	8.1E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
CA = chemical concentration in air
BR = Breathing Rate
AT = averaging time
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	8.39E-03	x	0.00E+00	=	0.00E+00	1.05E-01	/	1.00E+00	=	1.05E-01
Antimony	2.45E-07	x	0.00E+00	=	0.00E+00	3.06E-06	/	4.00E-04	=	7.66E-03
Arsenic	5.83E-06	x	1.50E+00	=	8.75E-06	7.29E-05	/	3.00E-04	=	2.43E-01
Barium	7.92E-05	x	0.00E+00	=	0.00E+00	9.90E-04	/	2.00E-01	=	4.95E-03
Beryllium	1.75E-07	x	0.00E+00	=	0.00E+00	2.19E-06	/	2.00E-03	=	1.09E-03
Cadmium	3.47E-06	x	0.00E+00	=	0.00E+00	4.34E-05	/	1.00E-03	=	4.34E-02
Chromium	1.12E-05	x	0.00E+00	=	0.00E+00	1.40E-04	/	3.00E-03	=	4.67E-02
Cobalt	1.05E-05	x	0.00E+00	=	0.00E+00	1.31E-04	/	3.00E-04	=	4.38E-01
Copper	1.48E-05	x	0.00E+00	=	0.00E+00	1.85E-04	/	4.00E-02	=	4.63E-03
Fluoride	3.53E-06	x	0.00E+00	=	0.00E+00	4.41E-05	/	4.00E-02	=	1.10E-03
Iron	2.59E-02	x	0.00E+00	=	0.00E+00	3.24E-01	/	7.00E-01	=	4.63E-01
Lithium	9.05E-06	x	0.00E+00	=	0.00E+00	1.13E-04	/	2.00E-03	=	5.66E-02
Manganese	4.09E-04	x	0.00E+00	=	0.00E+00	5.11E-03	/	1.40E-01	=	3.65E-02
Mercury	1.35E-08	x	0.00E+00	=	0.00E+00	1.69E-07	/	0.00E+00	=	NA
Nickel	1.10E-05	x	0.00E+00	=	0.00E+00	1.38E-04	/	2.00E-02	=	6.88E-03
Nitrate	3.97E-05	x	0.00E+00	=	0.00E+00	4.96E-04	/	7.10E+00	=	6.99E-05
Nitrite	5.31E-06	x	0.00E+00	=	0.00E+00	6.64E-05	/	3.00E-01	=	2.21E-04
Selenium	7.01E-07	x	0.00E+00	=	0.00E+00	8.76E-06	/	5.00E-03	=	1.75E-03
Silver	6.94E-08	x	0.00E+00	=	0.00E+00	8.68E-07	/	5.00E-03	=	1.74E-04
Strontium	3.73E-05	x	0.00E+00	=	0.00E+00	4.66E-04	/	6.00E-01	=	7.77E-04
Total Uranium	6.60E-07	x	0.00E+00	=	0.00E+00	8.25E-06	/	3.00E-03	=	2.75E-03
Vanadium	6.42E-05	x	0.00E+00	=	0.00E+00	8.03E-04	/	5.00E-03	=	1.61E-01
Zinc	4.86E-05	x	0.00E+00	=	0.00E+00	6.08E-04	/	3.00E-01	=	2.03E-03
Acetone	6.40E-09	x	0.00E+00	=	0.00E+00	8.00E-08	/	9.00E-01	=	8.89E-08
Butylbenzylphthalate	1.07E-07	x	1.90E-03	=	2.03E-10	1.34E-06	/	2.00E-01	=	6.69E-06
2-Hexanone	2.77E-09	x	0.00E+00	=	0.00E+00	3.46E-08	/	5.00E-03	=	6.93E-06
Methylene chloride	1.40E-09	x	2.00E-03	=	2.80E-12	1.75E-08	/	6.00E-03	=	2.92E-06
Toluene	5.92E-10	x	0.00E+00	=	0.00E+00	7.40E-09	/	8.00E-02	=	9.25E-08
			Pathway total	=	8.75E-06			Pathway total	=	1.63E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
	CDI	x	CPFi	=	CR	CDI	/	RfDi	=	HQ
	mg/kg-day		kg-day/mg		unitless	mg/kg-day		mg/kg-day		unitless
Aluminum	1.31E-08	x	0.00E+00	=	0.00E+00	7.18E-08	/	1.43E-03	=	5.03E-05
Antimony	3.84E-13	x	0.00E+00	=	0.00E+00	2.10E-12	/	0.00E+00	=	NA
Arsenic	9.13E-12	x	1.51E+01	=	1.37E-10	4.99E-11	/	4.29E-06	=	1.16E-05
Barium	1.24E-10	x	0.00E+00	=	0.00E+00	6.78E-10	/	1.43E-04	=	4.75E-06
Beryllium	2.74E-13	x	8.40E+00	=	2.30E-12	1.50E-12	/	5.71E-06	=	2.62E-07
Cadmium	5.43E-12	x	6.30E+00	=	3.42E-11	2.97E-11	/	2.86E-06	=	1.04E-05
Chromium	1.75E-11	x	0.00E+00	=	0.00E+00	9.59E-11	/	0.00E+00	=	NA
Cobalt	1.64E-11	x	3.15E+01	=	5.18E-10	8.99E-11	/	1.71E-06	=	5.24E-05
Copper	2.32E-11	x	0.00E+00	=	0.00E+00	1.27E-10	/	0.00E+00	=	NA
Fluoride	5.53E-12	x	0.00E+00	=	0.00E+00	3.02E-11	/	3.71E-03	=	8.14E-09
Iron	4.05E-08	x	0.00E+00	=	0.00E+00	2.22E-07	/	0.00E+00	=	NA
Lithium	1.42E-11	x	0.00E+00	=	0.00E+00	7.75E-11	/	0.00E+00	=	NA
Manganese	6.40E-10	x	0.00E+00	=	0.00E+00	3.50E-09	/	1.43E-05	=	2.45E-04
Mercury	2.11E-14	x	0.00E+00	=	0.00E+00	1.16E-13	/	8.57E-05	=	1.35E-09
Nickel	1.72E-11	x	9.10E-01	=	1.57E-11	9.42E-11	/	2.57E-05	=	3.66E-06
Nitrate	6.22E-11	x	0.00E+00	=	0.00E+00	3.40E-10	/	0.00E+00	=	NA
Nitrite	8.31E-12	x	0.00E+00	=	0.00E+00	4.55E-11	/	0.00E+00	=	NA
Selenium	1.10E-12	x	0.00E+00	=	0.00E+00	6.00E-12	/	5.71E-03	=	1.05E-09
Silver	1.09E-13	x	0.00E+00	=	0.00E+00	5.94E-13	/	0.00E+00	=	NA
Strontium	5.84E-11	x	0.00E+00	=	0.00E+00	3.19E-10	/	0.00E+00	=	NA
Total Uranium	1.03E-12	x	0.00E+00	=	0.00E+00	5.65E-12	/	1.14E-05	=	4.94E-07
Vanadium	1.01E-10	x	0.00E+00	=	0.00E+00	5.50E-10	/	2.86E-05	=	1.92E-05
Zinc	7.61E-11	x	0.00E+00	=	0.00E+00	4.16E-10	/	0.00E+00	=	NA
Acetone	1.00E-14	x	0.00E+00	=	0.00E+00	5.48E-14	/	8.86E+00	=	6.19E-15
Butylbenzylphthalate	1.68E-13	x	0.00E+00	=	0.00E+00	9.16E-13	/	0.00E+00	=	NA
2-Hexanone	4.34E-15	x	0.00E+00	=	0.00E+00	2.37E-14	/	8.57E-03	=	2.77E-12
Methylene chloride	2.19E-15	x	3.50E-05	=	7.67E-20	1.20E-14	/	1.71E-01	=	6.99E-14
Toluene	9.27E-16	x	0.00E+00	=	0.00E+00	5.07E-15	/	1.43E+00	=	3.55E-15
			Pathway total =		7.07E-10			Pathway total =		3.98E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.0E-01**	6%
Antimony	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.7E-03	0%
Arsenic	Sum of all pathways	=	**8.75E-06**	Sum of all pathways	=	**2.4E-01**	15%
Barium	Sum of all pathways	=	**NA**	Sum of all pathways	=	5.0E-03	0%
Beryllium	Sum of all pathways	=	2.30E-12	Sum of all pathways	=	1.1E-03	0%
Cadmium	Sum of all pathways	=	3.42E-11	Sum of all pathways	=	**4.3E-02**	3%
Chromium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.7E-02**	3%
Cobalt	Sum of all pathways	=	5.18E-10	Sum of all pathways	=	**4.4E-01**	27%
Copper	Sum of all pathways	=	**NA**	Sum of all pathways	=	4.6E-03	0%
Fluoride	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.1E-03	0%
Iron	Sum of all pathways	=	**NA**	Sum of all pathways	=	**4.6E-01**	28%
Lithium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**5.7E-02**	3%
Manganese	Sum of all pathways	=	**NA**	Sum of all pathways	=	**3.7E-02**	2%
Mercury	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.3E-09	0%
Nickel	Sum of all pathways	=	1.57E-11	Sum of all pathways	=	6.9E-03	0%
Nitrate	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.0E-05	0%
Nitrite	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.2E-04	0%
Selenium	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.8E-03	0%
Silver	Sum of all pathways	=	**NA**	Sum of all pathways	=	1.7E-04	0%
Strontium	Sum of all pathways	=	**NA**	Sum of all pathways	=	7.8E-04	0%
Total Uranium	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.7E-03	0%
Vanadium	Sum of all pathways	=	**NA**	Sum of all pathways	=	**1.6E-01**	10%
Zinc	Sum of all pathways	=	**NA**	Sum of all pathways	=	2.0E-03	0%
Acetone	Sum of all pathways	=	**NA**	Sum of all pathways	=	8.9E-08	0%
Butylbenzylphthalate	Sum of all pathways	=	2.03E-10	Sum of all pathways	=	6.7E-06	0%
2-Hexanone	Sum of all pathways	=	**NA**	Sum of all pathways	=	6.9E-06	0%
Methylene chloride	Sum of all pathways	=	2.80E-12	Sum of all pathways	=	2.9E-06	0%
Toluene	Sum of all pathways	=	**NA**	Sum of all pathways	=	9.3E-08	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	8.75E-06

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.63E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Resident Child under MTCA Method B
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	

CARCINOGENIC EFFECTS

Aluminum	8.27E-03	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Antimony	2.91E-07	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Arsenic	7.00E-06	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Barium	9.69E-05	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Beryllium	2.35E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Boron	6.42E-06	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Chromium	1.00E-05	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Cobalt	8.73E-06	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Copper	1.32E-05	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Fluoride	2.02E-06	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Iron	2.31E-02	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Lithium	9.24E-06	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Manganese	3.64E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Mercury	2.06E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Molybdenum	2.53E-06	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nickel	9.80E-06	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrate	8.51E-06	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Nitrite	2.19E-06	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Selenium	2.00E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Strontium	4.96E-05	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Total Uranium	6.18E-07	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Vanadium	5.19E-05	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Zinc	4.53E-05	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Acetone	6.18E-09	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Benzene	3.28E-10	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Styrene	3.77E-10	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]
Toluene	7.38E-10	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	75	]

Equation	CDIingestion =	[	CS	x	SIR	x	ABI	x	UCF	x	EF	x	ED	]	/	[	ABW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		unitless		years				kg		years	
NONCARCINOGENIC EFFECTS																				
Aluminum	1.03E-01	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Antimony	3.64E-06	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Arsenic	8.75E-05	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Barium	1.21E-03	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Beryllium	2.94E-06	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Boron	8.03E-05	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Chromium	1.25E-04	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Cobalt	1.09E-04	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Copper	1.65E-04	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Fluoride	2.53E-05	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Iron	2.89E-01	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Lithium	1.16E-04	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Manganese	4.55E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Mercury	2.58E-07	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Molybdenum	3.16E-05	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nickel	1.23E-04	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrate	1.06E-04	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Nitrite	2.74E-05	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Selenium	2.50E-05	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Strontium	6.20E-04	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Total Uranium	7.72E-06	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Vanadium	6.49E-04	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Zinc	5.66E-04	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Acetone	7.73E-08	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Benzene	4.10E-09	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Styrene	4.71E-09	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]
Toluene	9.23E-09	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	1	x	6	]	/	[	16	x	6	]

CDIingestion = chronic daily intake via soil ingestion
CS = chemical concentration in soil
SIR = soil ingestion rate
ABI = Gastrointestinal Absorption Fraction
UCF = unit conversion factor
EF = exposure frequency
ED = exposure duration
ABW = Average body weight
AT = averaging time

Daily Intake Calculations: Resident Adult under MTCA Method B
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
CARCINOGENIC EFFECTS																			
Aluminum	1.29E-08	=	[	1.1E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Antimony	4.56E-13	=	[	4.0E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Arsenic	1.10E-11	=	[	9.6E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Barium	1.52E-10	=	[	1.3E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Beryllium	3.68E-13	=	[	3.2E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Boron	1.01E-11	=	[	8.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Chromium	1.57E-11	=	[	1.4E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Cobalt	1.37E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Copper	2.07E-11	=	[	1.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Fluoride	3.16E-12	=	[	2.8E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Iron	3.62E-08	=	[	3.2E-04	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Lithium	1.45E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Manganese	5.70E-10	=	[	5.0E-06	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Mercury	3.23E-14	=	[	2.8E-10	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Molybdenum	3.96E-12	=	[	3.5E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nickel	1.53E-11	=	[	1.3E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrate	1.33E-11	=	[	1.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Nitrite	3.43E-12	=	[	3.0E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Selenium	3.13E-12	=	[	2.7E-08	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Strontium	7.77E-11	=	[	6.8E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Total Uranium	9.67E-13	=	[	8.5E-09	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Vanadium	8.13E-11	=	[	7.1E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Zinc	7.09E-11	=	[	6.2E-07	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Acetone	9.68E-15	=	[	8.5E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Benzene	5.14E-16	=	[	4.5E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Styrene	5.90E-16	=	[	5.2E-12	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]
Toluene	1.16E-15	=	[	1.0E-11	x	1	x	20	x	30	]	/	[(	75	x	70	x	1000	)]

Daily Intake Calculations: Resident Child under MTCA Method B

Equation	CDI	=	[	CA	x	EF	x	BR	x	ED	]	/	[(	AT	x	ABW	x	UCF	)]
Units	mg/kg-day			ug/m^3		unitless		m^3/day		years				years		kg		ug/mg	
NONCARCINOGENIC EFFECTS																			
Aluminum	7.08E-08	=	[	1.1E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Antimony	2.49E-12	=	[	4.0E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Arsenic	5.99E-11	=	[	9.6E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Barium	8.30E-10	=	[	1.3E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Beryllium	2.01E-12	=	[	3.2E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Boron	5.50E-11	=	[	8.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Chromium	8.56E-11	=	[	1.4E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Cobalt	7.47E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Copper	1.13E-10	=	[	1.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Fluoride	1.73E-11	=	[	2.8E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Iron	1.98E-07	=	[	3.2E-04	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Lithium	7.91E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Manganese	3.12E-09	=	[	5.0E-06	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Mercury	1.76E-13	=	[	2.8E-10	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Molybdenum	2.17E-11	=	[	3.5E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nickel	8.39E-11	=	[	1.3E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrate	7.29E-11	=	[	1.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Nitrite	1.88E-11	=	[	3.0E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Selenium	1.71E-11	=	[	2.7E-08	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Strontium	4.25E-10	=	[	6.8E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Total Uranium	5.29E-12	=	[	8.5E-09	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Vanadium	4.44E-10	=	[	7.1E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Zinc	3.88E-10	=	[	6.2E-07	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Acetone	5.29E-14	=	[	8.5E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Benzene	2.81E-15	=	[	4.5E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Styrene	3.23E-15	=	[	5.2E-12	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]
Toluene	6.32E-15	=	[	1.0E-11	x	1	x	10	x	6	]	/	[(	6	x	16	x	1000	)]

CDI = chronic daily intake via inhalation
CA = chemical concentration in air
EF = exposure frequency
BR = Breathing Rate
ED = exposure duration
AT = averaging time
ABW = Average body weight
UCF = unit conversion factor

Risk Characterization under MTCA Method B
Residential Receptor Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	8.27E-03	x	0.00E+00	=	0.00E+00	1.03E-01	/	1.00E+00	=	1.03E-01
Antimony	2.91E-07	x	0.00E+00	=	0.00E+00	3.64E-06	/	4.00E-04	=	9.09E-03
Arsenic	7.00E-06	x	1.50E+00	=	1.05E-05	8.75E-05	/	3.00E-04	=	2.92E-01
Barium	9.69E-05	x	0.00E+00	=	0.00E+00	1.21E-03	/	2.00E-01	=	6.06E-03
Beryllium	2.35E-07	x	0.00E+00	=	0.00E+00	2.94E-06	/	2.00E-03	=	1.47E-03
Boron	6.42E-06	x	0.00E+00	=	0.00E+00	8.03E-05	/	2.00E-01	=	4.01E-04
Chromium	1.00E-05	x	0.00E+00	=	0.00E+00	1.25E-04	/	3.00E-03	=	4.17E-02
Cobalt	8.73E-06	x	0.00E+00	=	0.00E+00	1.09E-04	/	3.00E-04	=	3.64E-01
Copper	1.32E-05	x	0.00E+00	=	0.00E+00	1.65E-04	/	4.00E-02	=	4.13E-03
Fluoride	2.02E-06	x	0.00E+00	=	0.00E+00	2.53E-05	/	4.00E-02	=	6.31E-04
Iron	2.31E-02	x	0.00E+00	=	0.00E+00	2.89E-01	/	7.00E-01	=	4.13E-01
Lithium	9.24E-06	x	0.00E+00	=	0.00E+00	1.16E-04	/	2.00E-03	=	5.78E-02
Manganese	3.64E-04	x	0.00E+00	=	0.00E+00	4.55E-03	/	1.40E-01	=	3.25E-02
Mercury	2.06E-08	x	0.00E+00	=	0.00E+00	2.58E-07	/	0.00E+00	=	NA
Molybdenum	2.53E-06	x	0.00E+00	=	0.00E+00	3.16E-05	/	5.00E-03	=	6.33E-03
Nickel	9.80E-06	x	0.00E+00	=	0.00E+00	1.23E-04	/	2.00E-02	=	6.13E-03
Nitrate	8.51E-06	x	0.00E+00	=	0.00E+00	1.06E-04	/	7.10E+00	=	1.50E-05
Nitrite	2.19E-06	x	0.00E+00	=	0.00E+00	2.74E-05	/	3.00E-01	=	9.13E-05
Selenium	2.00E-06	x	0.00E+00	=	0.00E+00	2.50E-05	/	5.00E-03	=	5.00E-03
Strontium	4.96E-05	x	0.00E+00	=	0.00E+00	6.20E-04	/	6.00E-01	=	1.03E-03
Total Uranium	6.18E-07	x	0.00E+00	=	0.00E+00	7.72E-06	/	3.00E-03	=	2.57E-03
Vanadium	5.19E-05	x	0.00E+00	=	0.00E+00	6.49E-04	/	5.00E-03	=	1.30E-01
Zinc	4.53E-05	x	0.00E+00	=	0.00E+00	5.66E-04	/	3.00E-01	=	1.89E-03
Acetone	6.18E-09	x	0.00E+00	=	0.00E+00	7.73E-08	/	9.00E-01	=	8.58E-08
Benzene	3.28E-10	x	5.50E-02	=	1.80E-11	4.10E-09	/	4.00E-03	=	1.03E-06
Styrene	3.77E-10	x	0.00E+00	=	0.00E+00	4.71E-09	/	2.00E-01	=	2.36E-08
Toluene	7.38E-10	x	0.00E+00	=	0.00E+00	9.23E-09	/	8.00E-02	=	1.15E-07
			Pathway total	=	1.05E-05			Pathway total	=	1.48E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CPFi**	**=**	**CR**	**CDI**	**/**	**RfDi**	**=**	**HQ**
Units	**mg/kg-day**		**kg-day/mg**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	1.29E-08	x	0.00E+00	=	0.00E+00	7.08E-08	/	1.43E-03	=	4.96E-05
Antimony	4.56E-13	x	0.00E+00	=	0.00E+00	2.49E-12	/	0.00E+00	=	NA
Arsenic	1.10E-11	x	1.51E+01	=	1.65E-10	5.99E-11	/	4.29E-06	=	1.40E-05
Barium	1.52E-10	x	0.00E+00	=	0.00E+00	8.30E-10	/	1.43E-04	=	5.81E-06
Beryllium	3.68E-13	x	8.40E+00	=	3.09E-12	2.01E-12	/	5.71E-06	=	3.52E-07
Boron	1.01E-11	x	0.00E+00	=	0.00E+00	5.50E-11	/	5.71E-03	=	9.62E-09
Chromium	1.57E-11	x	0.00E+00	=	0.00E+00	8.56E-11	/	0.00E+00	=	NA
Cobalt	1.37E-11	x	3.15E+01	=	4.31E-10	7.47E-11	/	1.71E-06	=	4.36E-05
Copper	2.07E-11	x	0.00E+00	=	0.00E+00	1.13E-10	/	0.00E+00	=	NA
Fluoride	3.16E-12	x	0.00E+00	=	0.00E+00	1.73E-11	/	3.71E-03	=	4.66E-09
Iron	3.62E-08	x	0.00E+00	=	0.00E+00	1.98E-07	/	0.00E+00	=	NA
Lithium	1.45E-11	x	0.00E+00	=	0.00E+00	7.91E-11	/	0.00E+00	=	NA
Manganese	5.70E-10	x	0.00E+00	=	0.00E+00	3.12E-09	/	1.43E-05	=	2.18E-04
Mercury	3.23E-14	x	0.00E+00	=	0.00E+00	1.76E-13	/	8.57E-05	=	2.06E-09
Molybdenum	3.96E-12	x	0.00E+00	=	0.00E+00	2.17E-11	/	0.00E+00	=	NA
Nickel	1.53E-11	x	9.10E-01	=	1.40E-11	8.39E-11	/	2.57E-05	=	3.26E-06
Nitrate	1.33E-11	x	0.00E+00	=	0.00E+00	7.29E-11	/	0.00E+00	=	NA
Nitrite	3.43E-12	x	0.00E+00	=	0.00E+00	1.88E-11	/	0.00E+00	=	NA
Selenium	3.13E-12	x	0.00E+00	=	0.00E+00	1.71E-11	/	5.71E-03	=	3.00E-09
Strontium	7.77E-11	x	0.00E+00	=	0.00E+00	4.25E-10	/	0.00E+00	=	NA
Total Uranium	9.67E-13	x	0.00E+00	=	0.00E+00	5.29E-12	/	1.14E-05	=	4.63E-07
Vanadium	8.13E-11	x	0.00E+00	=	0.00E+00	4.44E-10	/	2.86E-05	=	1.56E-05
Zinc	7.09E-11	x	0.00E+00	=	0.00E+00	3.88E-10	/	0.00E+00	=	NA
Acetone	9.68E-15	x	0.00E+00	=	0.00E+00	5.29E-14	/	8.86E+00	=	5.97E-15
Benzene	5.14E-16	x	2.73E-02	=	1.40E-17	2.81E-15	/	8.57E-03	=	3.28E-13
Styrene	5.90E-16	x	0.00E+00	=	0.00E+00	3.23E-15	/	2.86E-01	=	1.13E-14
Toluene	1.16E-15	x	0.00E+00	=	0.00E+00	6.32E-15	/	1.43E+00	=	4.42E-15
			Pathway total =		6.13E-10			Pathway total =		3.51E-04

Chemical Totals

	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.0E-01**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-03	1%
Arsenic	Sum of all pathways	=	**1.05E-05**	Sum of all pathways	=	**2.9E-01**	20%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-03	0%
Beryllium	Sum of all pathways	=	3.09E-12	Sum of all pathways	=	1.5E-03	0%
Boron	Sum of all pathways	=	NA	Sum of all pathways	=	4.0E-04	0%
Chromium	Sum of all pathways	=	NA	Sum of all pathways	=	**4.2E-02**	3%
Cobalt	Sum of all pathways	=	4.31E-10	Sum of all pathways	=	**3.6E-01**	25%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**4.1E-01**	28%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**5.8E-02**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**3.3E-02**	2%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	2.1E-09	0%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-03	0%
Nickel	Sum of all pathways	=	1.40E-11	Sum of all pathways	=	6.1E-03	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	9.1E-05	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-03	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-03	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.3E-01**	9%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	1.9E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	8.6E-08	0%
Benzene	Sum of all pathways	=	1.80E-11	Sum of all pathways	=	1.0E-06	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.05E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.48E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Maximum Risk Assessment Results for WAC Residential Receptor

Exposure Pathways	Exposure Areas									
	A plus B	**C**	**E**	**F plus G**	**H plus I**	**J**	**L1 plus L2**	**P**	**R**	**U**
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	6E-06	3E-05	8E-06	5E-06	8E-06	1E-05	5E-06	8E-06	9E-06	1E-05
Inhalation	6E-10	1E-09	6E-10	5E-10	6E-10	6E-10	5E-10	6E-10	7E-10	6E-10
ELCR	6E-06	**3E-05**	8E-06	5E-06	8E-06	1E-05	5E-06	8E-06	9E-06	1E-05
Major Risk Contributors	None	Arsenic	None							
Noncancer Hazard for Residential Adult- Nonradiological COPCs										
Soil Ingestion	1E+00	2E+00	2E+00	1E+00	1.5E+00	**2E+00**	1E+00	2E+00	1.6E+00	1.5E+00
Inhalation	3E-04	5E-04	4E-04	4E-04	4E-04	4E-04	3E-04	4E-04	4E-04	4E-04
HI	**1.4**	**2.4**	**1.5**	**1.3**	**1.5**	**1.6**	**1.3**	**1.5**	**1.6**	**1.5**
Major Hazard Contributors	**Common for All EAs** Aluminum, Arsenic, Chromium, Cobalt, Iron, Lithium, Manganese, and Vanadium **Specific to EA J** Antimony **Specific to EA E and EA R** Cadmium									

Appendix C

Attachment C-10: Results of Nonradiological Risk Assessment under CTUIR Residential Adult Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	3.94E-02	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.39E-06	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.96E-05	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.44E-04	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.05E-07	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	4.98E-05	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.75E-05	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.66E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.16E-05	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.26E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.35E-05	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.85E-03	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	5.66E-05	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	4.73E-05	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	4.83E-06	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	2.52E-07	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.97E-04	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	6.06E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.02E-06	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.13E-04	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.38E-04	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Diethylphthalate	1.78E-06	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1254	3.94E-08	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.31E-02	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.52E-06	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.14E-05	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	4.86E-04	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.53E-07	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	5.45E-05	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	5.20E-05	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	7.29E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.27E-05	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.38E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.76E-05	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.02E-03	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	6.20E-05	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	5.18E-05	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	5.29E-06	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	2.76E-07	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	2.16E-04	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	6.63E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.30E-06	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.43E-04	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.61E-04	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Diethylphthalate	1.94E-06	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1254	4.31E-08	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	9.46E-05	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.32E-09	=	[	3.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.70E-08	=	[	5.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.06E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.21E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.19E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.14E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.79E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.02E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.04E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.43E-06	=	[	4.8E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.36E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.14E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.16E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	6.05E-10	=	[	6.6E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.73E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	1.45E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	7.23E-09	=	[	7.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.51E-07	=	[	8.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.71E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Diethylphthalate	4.26E-09	=	[	4.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1254	9.44E-11	=	[	1.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.03E-04	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.63E-09	=	[	3.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	5.14E-08	=	[	5.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.16E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.33E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.31E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.25E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.05E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.14E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.85E-06	=	[	4.8E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.49E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.27E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	6.61E-10	=	[	6.6E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	5.17E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	7.91E-09	=	[	7.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.22E-07	=	[	8.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.25E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Diethylphthalate	4.66E-09	=	[	4.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1254	1.03E-10	=	[	1.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.86E-07	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.04E-10	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Diethylphthalate	1.77E-07	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1254	5.50E-09	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	6.41E-07	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.51E-10	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Diethylphthalate	1.94E-07	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1254	6.02E-09	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.94E-02	x	0.00E+00	=	0.00E+00	4.31E-02	/	1.00E+00	=	4.31E-02
Antimony	1.39E-06	x	0.00E+00	=	0.00E+00	1.52E-06	/	4.00E-04	=	3.79E-03
Arsenic	1.96E-05	x	1.50E+00	=	2.94E-05	2.14E-05	/	3.00E-04	=	7.14E-02
Barium	4.44E-04	x	0.00E+00	=	0.00E+00	4.86E-04	/	2.00E-01	=	2.43E-03
Cadmium	5.05E-07	x	0.00E+00	=	0.00E+00	5.53E-07	/	1.00E-03	=	5.53E-04
Chromium	4.98E-05	x	0.00E+00	=	0.00E+00	5.45E-05	/	3.00E-03	=	1.82E-02
Cobalt	4.75E-05	x	0.00E+00	=	0.00E+00	5.20E-05	/	3.00E-04	=	1.73E-01
Copper	6.66E-05	x	0.00E+00	=	0.00E+00	7.29E-05	/	4.00E-02	=	1.82E-03
Fluoride	1.16E-05	x	0.00E+00	=	0.00E+00	1.27E-05	/	4.00E-02	=	3.18E-04
Iron	1.26E-01	x	0.00E+00	=	0.00E+00	1.38E-01	/	7.00E-01	=	1.97E-01
Lithium	4.35E-05	x	0.00E+00	=	0.00E+00	4.76E-05	/	2.00E-03	=	2.38E-02
Manganese	1.85E-03	x	0.00E+00	=	0.00E+00	2.02E-03	/	1.40E-01	=	1.44E-02
Nickel	5.66E-05	x	0.00E+00	=	0.00E+00	6.20E-05	/	2.00E-02	=	3.10E-03
Nitrate	4.73E-05	x	0.00E+00	=	0.00E+00	5.18E-05	/	7.10E+00	=	7.29E-06
Nitrite	4.83E-06	x	0.00E+00	=	0.00E+00	5.29E-06	/	3.00E-01	=	1.76E-05
Silver	2.52E-07	x	0.00E+00	=	0.00E+00	2.76E-07	/	5.00E-03	=	5.52E-05
Strontium	1.97E-04	x	0.00E+00	=	0.00E+00	2.16E-04	/	6.00E-01	=	3.59E-04
Tin	6.06E-05	x	0.00E+00	=	0.00E+00	6.63E-05	/	6.00E-01	=	1.10E-04
Total Uranium	3.02E-06	x	0.00E+00	=	0.00E+00	3.30E-06	/	3.00E-03	=	1.10E-03
Vanadium	3.13E-04	x	0.00E+00	=	0.00E+00	3.43E-04	/	5.00E-03	=	6.85E-02
Zinc	2.38E-04	x	0.00E+00	=	0.00E+00	2.61E-04	/	3.00E-01	=	8.68E-04
Diethylphthalate	1.78E-06	x	0.00E+00	=	0.00E+00	1.94E-06	/	8.00E-01	=	2.43E-06
Aroclor-1254	3.94E-08	x	2.00E+00	=	7.88E-08	4.31E-08	/	2.00E-05	=	2.15E-03
			Pathway total	=	2.95E-05			Pathway total	=	6.26E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.46E-05	x		=	NA	1.03E-04	/[	5.00E-03	x	1000	]=	2.07E-05
Antimony	3.32E-09	x		=	NA	3.63E-09	/[		x	1000	]=	NA
Arsenic	4.70E-08	x	4.30E-03	=	2.02E-10	5.14E-08	/[	1.50E-05	x	1000	]=	3.43E-06
Barium	1.06E-06	x		=	NA	1.16E-06	/[	5.00E-04	x	1000	]=	2.33E-06
Cadmium	1.21E-09	x	1.80E-03	=	2.18E-12	1.33E-09	/[	1.00E-05	x	1000	]=	1.33E-07
Chromium	1.19E-07	x	8.40E-02	=	1.00E-08	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	1.14E-07	x	9.00E-03	=	1.03E-09	1.25E-07	/[	6.00E-06	x	1000	]=	2.08E-05
Copper	1.60E-07	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	2.79E-08	x		=	NA	3.05E-08	/[	1.30E-02	x	1000	]=	2.34E-09
Iron	3.02E-04	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.04E-07	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	4.43E-06	x		=	NA	4.85E-06	/[	5.00E-05	x	1000	]=	9.70E-05
Nickel	1.36E-07	x	2.60E-04	=	3.53E-11	1.49E-07	/[	9.00E-05	x	1000	]=	1.65E-06
Nitrate	1.14E-07	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Nitrite	1.16E-08	x		=	NA	1.27E-08	/[		x	1000	]=	NA
Silver	6.05E-10	x		=	NA	6.61E-10	/[		x	1000	]=	NA
Strontium	4.73E-07	x		=	NA	5.17E-07	/[		x	1000	]=	NA
Tin	1.45E-07	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Total Uranium	7.23E-09	x		=	NA	7.91E-09	/[	4.00E-05	x	1000	]=	1.98E-07
Vanadium	7.51E-07	x		=	NA	8.22E-07	/[	1.00E-04	x	1000	]=	8.22E-06
Zinc	5.71E-07	x		=	NA	6.25E-07	/[		x	1000	]=	NA
Diethylphthalate	4.26E-09	x		=	NA	4.66E-09	/[		x	1000	]=	NA
Aroclor-1254	9.44E-11	x	5.70E-04	=	5.38E-14	1.03E-10	/[		x	1000	]=	NA
			Pathway total =		1.13E-08					Pathway total =		1.56E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.86E-07	x	1.50E+00	=	8.80E-07	6.41E-07	/	3.00E-04	=	2.14E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	5.04E-10	x		=	NA	5.51E-10	/	2.50E-05	=	2.21E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	1.77E-07	x		=	NA	1.94E-07	/	8.00E-01	=	2.42E-07
Aroclor-1254	5.50E-09	x	2.00E+00	=	1.10E-08	6.02E-09	/	2.00E-05	=	3.01E-04
			Pathway total =		8.91E-07			Pathway total =		2.46E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.8E-03
Arsenic	Sum of all pathways	=	3.03E-05	100%	Sum of all pathways	=	7.4E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-03
Cadmium	Sum of all pathways	=	2.18E-12	0%	Sum of all pathways	=	5.7E-04
Chromium	Sum of all pathways	=	1.00E-08	0%	Sum of all pathways	=	1.8E-02
Cobalt	Sum of all pathways	=	1.03E-09	0%	Sum of all pathways	=	1.7E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02
Nickel	Sum of all pathways	=	3.53E-11	0%	Sum of all pathways	=	3.1E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	7.3E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	5.5E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	6.9E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	8.7E-04
Diethylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	2.7E-06
Aroclor-1254	Sum of all pathways	=	8.98E-08	0%	Sum of all pathways	=	2.5E-03

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**3E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	6.29E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.97E-02	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	3.77E-06	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.11E-04	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	5.16E-04	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	2.11E-06	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.84E-07	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	6.69E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	5.75E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	9.46E-05	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.20E-05	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.49E-01	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	6.32E-05	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.35E-03	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	2.64E-08	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	6.79E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	9.09E-05	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.10E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	4.18E-07	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	2.34E-04	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	4.42E-06	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	4.10E-04	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.67E-04	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.22E-07	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	5.43E-02	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	4.12E-06	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.21E-04	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	5.65E-04	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	2.30E-06	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	8.57E-07	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	7.31E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	6.29E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	1.03E-04	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.31E-05	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.63E-01	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	6.91E-05	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.57E-03	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	2.89E-08	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	7.43E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	9.94E-05	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.21E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	4.57E-07	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	2.55E-04	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	4.83E-06	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	4.49E-04	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.92E-04	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.61E-07	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.19E-04	=	[	1.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	9.03E-09	=	[	9.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	2.66E-07	=	[	2.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.24E-06	=	[	1.4E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	5.05E-09	=	[	5.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.88E-09	=	[	2.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.60E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.38E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	2.27E-07	=	[	2.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.87E-08	=	[	3.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.58E-04	=	[	3.9E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.52E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.62E-06	=	[	6.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	6.34E-11	=	[	6.9E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.63E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	2.18E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	2.64E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.00E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	5.60E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.06E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	9.83E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.40E-07	=	[	7.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.01E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.30E-04	=	[	1.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	9.88E-09	=	[	9.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	2.90E-07	=	[	2.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.35E-06	=	[	1.4E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	5.52E-09	=	[	5.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	2.05E-09	=	[	2.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.75E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.48E-07	=	[	2.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.14E-08	=	[	3.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.92E-04	=	[	3.9E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.66E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	6.15E-06	=	[	6.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	6.93E-11	=	[	6.9E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	2.38E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.10E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	6.12E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	1.16E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	7.00E-07	=	[	7.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.11E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	3.31E-06	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.82E-10	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.21E-08	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	3.63E-06	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	8.55E-10	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.60E-08	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.97E-02	x	0.00E+00	=	0.00E+00	5.43E-02	/	1.00E+00	=	5.43E-02
Antimony	3.77E-06	x	0.00E+00	=	0.00E+00	4.12E-06	/	4.00E-04	=	1.03E-02
Arsenic	1.11E-04	x	1.50E+00	=	1.66E-04	1.21E-04	/	3.00E-04	=	4.04E-01
Barium	5.16E-04	x	0.00E+00	=	0.00E+00	5.65E-04	/	2.00E-01	=	2.82E-03
Beryllium	2.11E-06	x	0.00E+00	=	0.00E+00	2.30E-06	/	2.00E-03	=	1.15E-03
Cadmium	7.84E-07	x	0.00E+00	=	0.00E+00	8.57E-07	/	1.00E-03	=	8.57E-04
Chromium	6.69E-05	x	0.00E+00	=	0.00E+00	7.31E-05	/	3.00E-03	=	2.44E-02
Cobalt	5.75E-05	x	0.00E+00	=	0.00E+00	6.29E-05	/	3.00E-04	=	2.10E-01
Copper	9.46E-05	x	0.00E+00	=	0.00E+00	1.03E-04	/	4.00E-02	=	2.59E-03
Fluoride	1.20E-05	x	0.00E+00	=	0.00E+00	1.31E-05	/	4.00E-02	=	3.27E-04
Iron	1.49E-01	x	0.00E+00	=	0.00E+00	1.63E-01	/	7.00E-01	=	2.33E-01
Lithium	6.32E-05	x	0.00E+00	=	0.00E+00	6.91E-05	/	2.00E-03	=	3.46E-02
Manganese	2.35E-03	x	0.00E+00	=	0.00E+00	2.57E-03	/	1.40E-01	=	1.83E-02
Mercury	2.64E-08	x	0.00E+00	=	0.00E+00	2.89E-08	/	0.00E+00	=	NA
Nickel	6.79E-05	x	0.00E+00	=	0.00E+00	7.43E-05	/	2.00E-02	=	3.71E-03
Nitrate	9.09E-05	x	0.00E+00	=	0.00E+00	9.94E-05	/	7.10E+00	=	1.40E-05
Nitrite	1.10E-05	x	0.00E+00	=	0.00E+00	1.21E-05	/	3.00E-01	=	4.02E-05
Silver	4.18E-07	x	0.00E+00	=	0.00E+00	4.57E-07	/	5.00E-03	=	9.14E-05
Strontium	2.34E-04	x	0.00E+00	=	0.00E+00	2.55E-04	/	6.00E-01	=	4.26E-04
Total Uranium	4.42E-06	x	0.00E+00	=	0.00E+00	4.83E-06	/	3.00E-03	=	1.61E-03
Vanadium	4.10E-04	x	0.00E+00	=	0.00E+00	4.49E-04	/	5.00E-03	=	8.97E-02
Zinc	2.67E-04	x	0.00E+00			2.92E-04	/	3.00E-01	=	9.73E-04
Butylbenzylphthalate	4.22E-07	x	1.90E-03	=	8.01E-10	4.61E-07	/	2.00E-01	=	2.31E-06
			Pathway total	=	1.66E-04			Pathway total	=	1.09E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.19E-04	x		=	NA	1.30E-04	/[	5.00E-03	x	1000	]=	2.61E-05
Antimony	9.03E-09	x		=	NA	9.88E-09	/[		x	1000	]=	NA
Arsenic	2.66E-07	x	4.30E-03	=	1.14E-09	2.90E-07	/[	1.50E-05	x	1000	]=	1.94E-05
Barium	1.24E-06	x		=	NA	1.35E-06	/[	5.00E-04	x	1000	]=	2.71E-06
Beryllium	5.05E-09	x	2.40E-03	=	1.21E-11	5.52E-09	/[	2.00E-05	x	1000	]=	2.76E-07
Cadmium	1.88E-09	x	1.80E-03	=	3.38E-12	2.05E-09	/[	1.00E-05	x	1000	]=	2.05E-07
Chromium	1.60E-07	x	8.40E-02	=	1.35E-08	1.75E-07	/[	1.00E-04	x	1000	]=	1.75E-06
Cobalt	1.38E-07	x	9.00E-03	=	1.24E-09	1.51E-07	/[	6.00E-06	x	1000	]=	2.51E-05
Copper	2.27E-07	x		=	NA	2.48E-07	/[		x	1000	]=	NA
Fluoride	2.87E-08	x		=	NA	3.14E-08	/[	1.30E-02	x	1000	]=	2.41E-09
Iron	3.58E-04	x		=	NA	3.92E-04	/[		x	1000	]=	NA
Lithium	1.52E-07	x		=	NA	1.66E-07	/[		x	1000	]=	NA
Manganese	5.62E-06	x		=	NA	6.15E-06	/[	5.00E-05	x	1000	]=	1.23E-04
Mercury	6.34E-11	x	0.00E+00	=	0.00E+00	6.93E-11	/[	3.00E-04	x	1000	]=	2.31E-10
Nickel	1.63E-07	x	2.60E-04	=	4.23E-11	1.78E-07	/[	9.00E-05	x	1000	]=	1.98E-06
Nitrate	2.18E-07	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Nitrite	2.64E-08	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Silver	1.00E-09	x		=	NA	1.10E-09	/[		x	1000	]=	NA
Strontium	5.60E-07	x		=	NA	6.12E-07	/[		x	1000	]=	NA
Total Uranium	1.06E-08	x		=	NA	1.16E-08	/[	4.00E-05	x	1000	]=	2.90E-07
Vanadium	9.83E-07	x		=	NA	1.08E-06	/[	1.00E-04	x	1000	]=	1.08E-05
Zinc	6.40E-07	x				7.00E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	1.01E-09	x	0.00E+00	=	0.00E+00	1.11E-09	/		x	1000	]=	NA
			Pathway total =		1.59E-08					Pathway total =		2.12E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.31E-06	x	1.50E+00	=	4.97E-06	3.63E-06	/	3.00E-04	=	1.21E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.82E-10	x		=	NA	8.55E-10	/	2.50E-05	=	3.42E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	4.21E-08	x	1.90E-03	=	7.99E-11	4.60E-08	/	2.00E-01	=	2.30E-07
			Pathway total =		4.97E-06			Pathway total =		1.21E-02

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**5.4E-02**	5%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	1%
Arsenic	Sum of all pathways	=	1.71E-04	100%	Sum of all pathways	=	**4.2E-01**	38%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.8E-03	0%
Beryllium	Sum of all pathways	=	1.21E-11		Sum of all pathways	=	1.2E-03	0%
Cadmium	Sum of all pathways	=	3.38E-12		Sum of all pathways	=	8.9E-04	0%
Chromium	Sum of all pathways	=	1.35E-08		Sum of all pathways	=	**2.4E-02**	2%
Cobalt	Sum of all pathways	=	1.24E-09		Sum of all pathways	=	**2.1E-01**	19%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-04	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**2.3E-01**	21%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.5E-02**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**1.8E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-10	0%
Nickel	Sum of all pathways	=	4.23E-11		Sum of all pathways	=	3.7E-03	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-05	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	9.1E-05	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**9.0E-02**	8%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	9.7E-04	0%
Butylbenzylphthalate	Sum of all pathways	=	8.81E-10		Sum of all pathways	=	2.5E-06	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.71E-04**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**1.11E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.88E-02	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	9.30E-07	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	2.72E-05	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.10E-04	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	8.31E-07	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	1.74E-05	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.70E-05	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	8.99E-05	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.61E-05	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	8.62E-05	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	7.73E-06	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.26E-01	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.77E-05	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.59E-03	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	1.21E-07	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	6.48E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.62E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	7.31E-06	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	2.93E-06	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	4.44E-07	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.81E-04	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	4.32E-06	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.07E-04	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.34E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	3.46E-08	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.48E-07	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	1.76E-09	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aldrin	1.04E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	4.24E-02	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.02E-06	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.97E-05	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	4.48E-04	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	9.09E-07	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	1.91E-05	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.86E-05	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	9.83E-05	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	5.04E-05	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	9.43E-05	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	8.46E-06	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.38E-01	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	5.22E-05	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.83E-03	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	1.33E-07	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	7.09E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.87E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	8.00E-06	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	3.20E-06	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	4.86E-07	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.98E-04	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	4.73E-06	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.36E-04	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.56E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	3.79E-08	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	7.09E-07	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	1.93E-09	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aldrin	1.14E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.29E-05	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.23E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.51E-08	=	[	7.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	9.82E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	1.99E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	4.18E-08	=	[	4.6E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	4.08E-08	=	[	4.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	2.15E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.10E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	2.07E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.85E-08	=	[	2.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.03E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.14E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	6.20E-06	=	[	6.8E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.91E-10	=	[	3.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.55E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	6.29E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.75E-08	=	[	1.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	7.01E-09	=	[	7.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.06E-09	=	[	1.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.35E-07	=	[	4.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.04E-08	=	[	1.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.36E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.61E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	8.30E-11	=	[	9.1E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.55E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	4.22E-12	=	[	4.6E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aldrin	2.50E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.02E-04	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	2.44E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	7.12E-08	=	[	7.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.18E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	4.58E-08	=	[	4.6E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	4.47E-08	=	[	4.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	2.36E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.21E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.26E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.03E-08	=	[	2.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.32E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	6.78E-06	=	[	6.8E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	3.18E-10	=	[	3.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.92E-08	=	[	1.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	7.67E-09	=	[	7.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.16E-09	=	[	1.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.75E-07	=	[	4.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	1.13E-08	=	[	1.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.05E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.14E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	9.08E-11	=	[	9.1E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.70E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	4.62E-12	=	[	4.6E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aldrin	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	8.13E-07	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.70E-08	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.46E-08	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aldrin	1.04E-09	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.89E-07	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.86E-08	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	7.07E-08	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aldrin	1.14E-09	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.88E-02	x	0.00E+00	=	0.00E+00	4.24E-02	/	1.00E+00	=	4.24E-02
Antimony	9.30E-07	x	0.00E+00	=	0.00E+00	1.02E-06	/	4.00E-04	=	2.54E-03
Arsenic	2.72E-05	x	1.50E+00	=	4.08E-05	2.97E-05	/	3.00E-04	=	9.90E-02
Barium	4.10E-04	x	0.00E+00	=	0.00E+00	4.48E-04	/	2.00E-01	=	2.24E-03
Beryllium	8.31E-07	x	0.00E+00	=	0.00E+00	9.09E-07	/	2.00E-03	=	4.54E-04
Boron	1.74E-05	x	0.00E+00	=	0.00E+00	1.91E-05	/	2.00E-01	=	9.54E-05
Cadmium	1.70E-05	x	0.00E+00	=	0.00E+00	1.86E-05	/	1.00E-03	=	1.86E-02
Chromium	8.99E-05	x	0.00E+00	=	0.00E+00	9.83E-05	/	3.00E-03	=	3.28E-02
Cobalt	4.61E-05	x	0.00E+00	=	0.00E+00	5.04E-05	/	3.00E-04	=	1.68E-01
Copper	8.62E-05	x	0.00E+00	=	0.00E+00	9.43E-05	/	4.00E-02	=	2.36E-03
Fluoride	7.73E-06	x	0.00E+00	=	0.00E+00	8.46E-06	/	4.00E-02	=	2.11E-04
Iron	1.26E-01	x	0.00E+00	=	0.00E+00	1.38E-01	/	7.00E-01	=	1.98E-01
Lithium	4.77E-05	x	0.00E+00	=	0.00E+00	5.22E-05	/	2.00E-03	=	2.61E-02
Manganese	2.59E-03	x	0.00E+00	=	0.00E+00	2.83E-03	/	1.40E-01	=	2.02E-02
Mercury	1.21E-07	x	0.00E+00	=	0.00E+00	1.33E-07	/	0.00E+00	=	NA
Nickel	6.48E-05	x	0.00E+00	=	0.00E+00	7.09E-05	/	2.00E-02	=	3.54E-03
Nitrate	2.62E-05	x	0.00E+00	=	0.00E+00	2.87E-05	/	7.10E+00	=	4.04E-06
Nitrite	7.31E-06	x	0.00E+00	=	0.00E+00	8.00E-06	/	3.00E-01	=	2.67E-05
Selenium	2.93E-06	x	0.00E+00	=	0.00E+00	3.20E-06	/	5.00E-03	=	6.40E-04
Silver	4.44E-07	x	0.00E+00	=	0.00E+00	4.86E-07	/	5.00E-03	=	9.71E-05
Strontium	1.81E-04	x	0.00E+00	=	0.00E+00	1.98E-04	/	6.00E-01	=	3.30E-04
Total Uranium	4.32E-06	x	0.00E+00	=	0.00E+00	4.73E-06	/	3.00E-03	=	1.58E-03
Vanadium	3.07E-04	x	0.00E+00	=	0.00E+00	3.36E-04	/	5.00E-03	=	6.72E-02
Zinc	2.34E-04	x	0.00E+00	=	0.00E+00	2.56E-04	/	3.00E-01	=	8.53E-04
Acetone	3.46E-08	x	0.00E+00	=	0.00E+00	3.79E-08	/	9.00E-01	=	4.21E-08
Butylbenzylphthalate	6.48E-07	x	1.90E-03	=	1.23E-09	7.09E-07	/	2.00E-01	=	3.54E-06
Toluene	1.76E-09	x	0.00E+00	=	0.00E+00	1.93E-09	/	8.00E-02	=	2.41E-08
Aldrin	1.04E-08	x	1.70E+01	=	1.78E-07	1.14E-08	/	3.00E-05	=	3.81E-04
			Pathway total	=	4.09E-05			Pathway total	=	6.87E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.29E-05	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	2.23E-09	x		=	NA	2.44E-09	/[		x	1000	]=	NA
Arsenic	6.51E-08	x	4.30E-03	=	2.80E-10	7.12E-08	/[	1.50E-05	x	1000	]=	4.75E-06
Barium	9.82E-07	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.15E-06
Beryllium	1.99E-09	x	2.40E-03	=	4.78E-12	2.18E-09	/[	2.00E-05	x	1000	]=	1.09E-07
Boron	4.18E-08	x	0.00E+00	=	0.00E+00	4.58E-08	/[	2.00E-02	x	1000	]=	2.29E-09
Cadmium	4.08E-08	x	1.80E-03	=	7.35E-11	4.47E-08	/[	1.00E-05	x	1001	]=	4.46E-06
Chromium	2.15E-07	x	8.40E-02	=	1.81E-08	2.36E-07	/[	1.00E-04	x	1002	]=	2.35E-06
Cobalt	1.10E-07	x	9.00E-03	=	9.94E-10	1.21E-07	/[	6.00E-06	x	1003	]=	2.01E-05
Copper	2.07E-07	x		=	NA	2.26E-07	/[		x	1004	]=	NA
Fluoride	1.85E-08	x		=	NA	2.03E-08	/[	1.30E-02	x	1005	]=	1.55E-09
Iron	3.03E-04	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	1.14E-07	x		=	NA	1.25E-07	/[		x	1000	]=	NA
Manganese	6.20E-06	x		=	NA	6.78E-06	/[	5.00E-05	x	1000	]=	1.36E-04
Mercury	2.91E-10	x	0.00E+00	=	0.00E+00	3.18E-10	/[	3.00E-04	x	1000	]=	1.06E-09
Nickel	1.55E-07	x	2.60E-04	=	4.04E-11	1.70E-07	/[	9.00E-05	x	1000	]=	1.89E-06
Nitrate	6.29E-08	x		=	NA	6.88E-08	/[		x	1000	]=	NA
Nitrite	1.75E-08	x		=	NA	1.92E-08	/[		x	1000	]=	NA
Selenium	7.01E-09	x	0.00E+00	=	0.00E+00	7.67E-09	/[	2.00E-02	x	1000	]=	3.84E-10
Silver	1.06E-09	x		=	NA	1.16E-09	/[		x	1000	]=	NA
Strontium	4.35E-07	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Total Uranium	1.04E-08	x		=	NA	1.13E-08	/[	4.00E-05	x	1000	]=	2.83E-07
Vanadium	7.36E-07	x		=	NA	8.05E-07	/[	1.00E-04	x	1000	]=	8.05E-06
Zinc	5.61E-07	x		=	NA	6.14E-07	/[		x	1000	]=	NA
Acetone	8.30E-11	x	0.00E+00	=	0.00E+00	9.08E-11	/[	3.10E+01	x	1000	]=	2.93E-15
Butylbenzylphthalate	1.55E-09	x	0.00E+00	=	0.00E+00	1.70E-09	/[		x	1000	]=	NA
Toluene	4.22E-12	x	0.00E+00	=	0.00E+00	4.62E-12	/[	5.00E+00	x	1000	]=	9.23E-16
Aldrin	2.50E-11	x	4.90E-03	=	1.23E-13	2.74E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.95E-08					Pathway total =		2.00E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	8.13E-07	x	1.50E+00	=	1.22E-06	8.89E-07	/	3.00E-04	=	2.96E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.70E-08	x		=	NA	1.86E-08	/	2.50E-05	=	7.43E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	6.46E-08	x	1.90E-03	=	1.23E-10	7.07E-08	/	2.00E-01	=	3.53E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	1.04E-09	x	1.70E+01	=	1.77E-08	1.14E-09	/	3.00E-05	=	3.80E-05
			Pathway total =		1.24E-06			Pathway total =		3.75E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Con	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	2.5E-03
Arsenic	Sum of all pathways	=	4.20E-05	99%	Sum of all pathways	=	1.0E-01
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-03
Beryllium	Sum of all pathways	=	4.78E-12		Sum of all pathways	=	4.5E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	9.5E-05
Cadmium	Sum of all pathways	=	7.35E-11		Sum of all pathways	=	1.9E-02
Chromium	Sum of all pathways	=	1.81E-08		Sum of all pathways	=	3.3E-02
Cobalt	Sum of all pathways	=	9.94E-10		Sum of all pathways	=	1.7E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-09
Nickel	Sum of all pathways	=	4.04E-11		Sum of all pathways	=	3.5E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.7E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	6.4E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	9.7E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	6.7E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	8.5E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-08
Butylbenzylphthalate	Sum of all pathways	=	1.35E-09		Sum of all pathways	=	3.9E-06
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-08
Aldrin	Sum of all pathways	=	1.95E-07		Sum of all pathways	=	4.2E-04

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**4E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	6.91E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.53E-02	=	[	6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.29E-06	=	[	2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.82E-05	=	[	3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.92E-04	=	[	9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.56E-06	=	[	2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.09E-07	=	[	1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	4.69E-05	=	[	8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.28E-05	=	[	8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.81E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.10E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.25E-01	=	[	2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	3.88E-05	=	[	7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.02E-03	=	[	3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	1.59E-07	=	[	3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	5.88E-05	=	[	1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	3.74E-05	=	[	7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.60E-05	=	[	3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	4.27E-07	=	[	8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.89E-04	=	[	3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	3.32E-05	=	[	6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.74E-06	=	[	7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.64E-04	=	[	6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.00E-04	=	[	3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
2-Butanone	1.30E-08	=	[	2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.11E-05	=	[	4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	1.88E-07	=	[	3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	1.04E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
o-Xylene	6.69E-10	=	[	1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	3.42E-09	=	[	6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	5.11E-09	=	[	9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Xylenes (total)	2.42E-09	=	[	4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.32E-07	=	[	2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	2.66E-08	=	[	5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.08E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.86E-02	=	[	6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.41E-06	=	[	2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.99E-05	=	[	3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	5.38E-04	=	[	9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.70E-06	=	[	2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.66E-07	=	[	1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	5.13E-05	=	[	8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	4.68E-05	=	[	8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	7.45E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.21E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.37E-01	=	[	2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.24E-05	=	[	7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.21E-03	=	[	3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	1.74E-07	=	[	3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	6.43E-05	=	[	1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	4.09E-05	=	[	7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.75E-05	=	[	3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	4.67E-07	=	[	8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	2.07E-04	=	[	3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	3.63E-05	=	[	6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	4.09E-06	=	[	7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.99E-04	=	[	6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.19E-04	=	[	3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
2-Butanone	1.42E-08	=	[	2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	2.30E-05	=	[	4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.38E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	2.05E-07	=	[	3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	1.14E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
o-Xylene	7.31E-10	=	[	1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	3.74E-09	=	[	6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	5.59E-09	=	[	9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Xylenes (total)	2.65E-09	=	[	4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.44E-07	=	[	2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Gamma-BHC (Lindane)	2.91E-08	=	[	5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	1.18E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.47E-05	=	[	9.3E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.10E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.37E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.18E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	3.73E-09	=	[	4.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.46E-09	=	[	1.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.12E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.02E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.63E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.65E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.00E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	9.30E-08	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.84E-06	=	[	5.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	3.81E-10	=	[	4.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.41E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	8.96E-08	=	[	9.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.83E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.02E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.53E-07	=	[	5.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	7.97E-08	=	[	8.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.96E-09	=	[	9.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.73E-07	=	[	9.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	4.80E-07	=	[	5.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
2-Butanone	3.11E-11	=	[	3.4E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	5.05E-08	=	[	5.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.42E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Hexane	4.50E-10	=	[	4.9E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	2.50E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
o-Xylene	1.60E-12	=	[	1.8E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	8.19E-12	=	[	9.0E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	1.22E-11	=	[	1.3E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.80E-12	=	[	6.3E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	3.16E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	6.39E-11	=	[	7.0E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.58E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.26E-05	=	[	9.3E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.39E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	4.78E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.29E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	4.08E-09	=	[	4.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.60E-09	=	[	1.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.23E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.12E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.28E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.02E-07	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.29E-06	=	[	5.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	4.16E-10	=	[	4.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.54E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	9.80E-08	=	[	9.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	4.19E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.12E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.96E-07	=	[	5.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	8.71E-08	=	[	8.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.80E-09	=	[	9.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	9.55E-07	=	[	9.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	5.25E-07	=	[	5.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
2-Butanone	3.40E-11	=	[	3.4E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	5.52E-08	=	[	5.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Hexane	4.92E-10	=	[	4.9E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
o-Xylene	1.75E-12	=	[	1.8E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	8.96E-12	=	[	9.0E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	1.34E-11	=	[	1.3E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Xylenes (total)	6.34E-12	=	[	6.3E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.46E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Gamma-BHC (Lindane)	6.99E-11	=	[	7.0E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1260	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.45E-07	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.07E-10	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.10E-06	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.32E-08	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.06E-09	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.50E-08	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	5.96E-07	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.64E-10	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	2.30E-06	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.38E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.44E-08	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Gamma-BHC (Lindane)	1.16E-09	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	1.64E-08	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.53E-02	x	0.00E+00	=	0.00E+00	3.86E-02	/	1.00E+00	=	3.86E-02
Antimony	1.29E-06	x	0.00E+00	=	0.00E+00	1.41E-06	/	4.00E-04	=	3.53E-03
Arsenic	1.82E-05	x	1.50E+00	=	2.73E-05	1.99E-05	/	3.00E-04	=	6.64E-02
Barium	4.92E-04	x	0.00E+00	=	0.00E+00	5.38E-04	/	2.00E-01	=	2.69E-03
Beryllium	1.56E-06	x	0.00E+00	=	0.00E+00	1.70E-06	/	2.00E-03	=	8.51E-04
Cadmium	6.09E-07	x	0.00E+00	=	0.00E+00	6.66E-07	/	1.00E-03	=	6.66E-04
Chromium	4.69E-05	x	0.00E+00	=	0.00E+00	5.13E-05	/	3.00E-03	=	1.71E-02
Cobalt	4.28E-05	x	0.00E+00	=	0.00E+00	4.68E-05	/	3.00E-04	=	1.56E-01
Copper	6.81E-05	x	0.00E+00	=	0.00E+00	7.45E-05	/	4.00E-02	=	1.86E-03
Fluoride	1.10E-05	x	0.00E+00	=	0.00E+00	1.21E-05	/	4.00E-02	=	3.02E-04
Iron	1.25E-01	x	0.00E+00	=	0.00E+00	1.37E-01	/	7.00E-01	=	1.95E-01
Lithium	3.88E-05	x	0.00E+00	=	0.00E+00	4.24E-05	/	2.00E-03	=	2.12E-02
Manganese	2.02E-03	x	0.00E+00	=	0.00E+00	2.21E-03	/	1.40E-01	=	1.58E-02
Mercury	1.59E-07	x	0.00E+00	=	0.00E+00	1.74E-07	/	0.00E+00	=	NA
Nickel	5.88E-05	x	0.00E+00	=	0.00E+00	6.43E-05	/	2.00E-02	=	3.22E-03
Nitrate	3.74E-05	x	0.00E+00	=	0.00E+00	4.09E-05	/	7.10E+00	=	5.76E-06
Nitrite	1.60E-05	x	0.00E+00	=	0.00E+00	1.75E-05	/	3.00E-01	=	5.83E-05
Silver	4.27E-07	x	0.00E+00	=	0.00E+00	4.67E-07	/	5.00E-03	=	9.35E-05
Strontium	1.89E-04	x	0.00E+00	=	0.00E+00	2.07E-04	/	6.00E-01	=	3.45E-04
Tin	3.32E-05	x	0.00E+00	=	0.00E+00	3.63E-05	/	6.00E-01	=	6.06E-05
Total Uranium	3.74E-06	x	0.00E+00	=	0.00E+00	4.09E-06	/	3.00E-03	=	1.36E-03
Vanadium	3.64E-04	x	0.00E+00	=	0.00E+00	3.99E-04	/	5.00E-03	=	7.97E-02
Zinc	2.00E-04	x	0.00E+00	=	0.00E+00	2.19E-04	/	3.00E-01	=	7.30E-04
2-Butanone	1.30E-08	x	0.00E+00	=	0.00E+00	1.42E-08	/	6.00E-01	=	2.37E-08
Bis(2-ethylhexyl) phthalate	2.11E-05	x	1.40E-02	=	2.95E-07	2.30E-05	/	2.00E-02	=	1.15E-03
Butylbenzylphthalate	3.09E-07	x	1.90E-03	=	5.88E-10	3.38E-07	/	2.00E-01	=	1.69E-06
Hexane	1.88E-07	x	0.00E+00	=	0.00E+00	2.05E-07	/	6.00E-02	=	3.42E-06
Methylene chloride	1.04E-08	x	2.00E-03	=	2.09E-11	1.14E-08	/	6.00E-03	=	1.90E-06
o-Xylene	6.69E-10	x	0.00E+00	=	0.00E+00	7.31E-10	/	2.00E-01	=	3.66E-09
Styrene	3.42E-09	x	0.00E+00	=	0.00E+00	3.74E-09	/	2.00E-01	=	1.87E-08
Toluene	5.11E-09	x	0.00E+00	=	0.00E+00	5.59E-09	/	8.00E-02	=	6.99E-08
Xylenes (total)	2.42E-09	x	0.00E+00	=	0.00E+00	2.65E-09	/	2.00E-01	=	1.32E-08
beta-BHC	1.32E-07	x	1.80E+00	=	2.37E-07	1.44E-07	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	2.66E-08	x	1.10E+00	=	2.93E-08	2.91E-08	/	3.00E-04	=	9.71E-05
Aroclor-1260	1.08E-07	x	2.00E+00	=	2.15E-07	1.18E-07	/	0.00E+00	=	NA
			Pathway total	=	2.81E-05			Pathway total	=	6.07E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.47E-05	x		=	NA	9.26E-05	/[	5.00E-03	x	1000	]=	1.85E-05
Antimony	3.10E-09	x		=	NA	3.39E-09	/[		x	1000	]=	NA
Arsenic	4.37E-08	x	4.30E-03	=	1.88E-10	4.78E-08	/[	1.50E-05	x	1000	]=	3.19E-06
Barium	1.18E-06	x		=	NA	1.29E-06	/[	5.00E-04	x	1000	]=	2.58E-06
Beryllium	3.73E-09	x	2.40E-03	=	8.96E-12	4.08E-09	/[	2.00E-05	x	1000	]=	2.04E-07
Cadmium	1.46E-09	x	1.80E-03	=	2.63E-12	1.60E-09	/[	1.00E-05	x	1000	]=	1.60E-07
Chromium	1.12E-07	x	8.40E-02	=	9.44E-09	1.23E-07	/[	1.00E-04	x	1000	]=	1.23E-06
Cobalt	1.02E-07	x	9.00E-03	=	9.22E-10	1.12E-07	/[	6.00E-06	x	1000	]=	1.87E-05
Copper	1.63E-07	x		=	NA	1.78E-07	/[		x	1000	]=	NA
Fluoride	2.65E-08	x		=	NA	2.89E-08	/[	1.30E-02	x	1000	]=	2.23E-09
Iron	3.00E-04	x		=	NA	3.28E-04	/[		x	1000	]=	NA
Lithium	9.30E-08	x		=	NA	1.02E-07	/[		x	1000	]=	NA
Manganese	4.84E-06	x		=	NA	5.29E-06	/[	5.00E-05	x	1000	]=	1.06E-04
Mercury	3.81E-10	x	0.00E+00	=	0.00E+00	4.16E-10	/[	3.00E-04	x	1000	]=	1.39E-09
Nickel	1.41E-07	x	2.60E-04	=	3.66E-11	1.54E-07	/[	9.00E-05	x	1000	]=	1.71E-06
Nitrate	8.96E-08	x		=	NA	9.80E-08	/[		x	1000	]=	NA
Nitrite	3.83E-08	x		=	NA	4.19E-08	/[		x	1000	]=	NA
Silver	1.02E-09	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	4.53E-07	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	7.97E-08	x		=	NA	8.71E-08	/[		x	1000	]=	NA
Total Uranium	8.96E-09	x		=	NA	9.80E-09	/[	4.00E-05	x	1000	]=	2.45E-07
Vanadium	8.73E-07	x		=	NA	9.55E-07	/[	1.00E-04	x	1000	]=	9.55E-06
Zinc	4.80E-07	x		=	NA	5.25E-07	/[		x	1000	]=	NA
2-Butanone	3.11E-11	x	0.00E+00	=	0.00E+00	3.40E-11	/[	5.00E+00	x	1000	]=	6.81E-15
Bis(2-ethylhexyl) phthalate	5.05E-08	x	2.40E-06	=	1.21E-13	5.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	7.42E-10	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	4.50E-10	x	0.00E+00	=	0.00E+00	4.92E-10	/[	7.00E-01	x	1000	]=	7.03E-13
Methylene chloride	2.50E-11	x	1.00E-08	=	2.50E-19	2.74E-11	/[	6.00E-01	x	1000	]=	4.57E-14
o-Xylene	1.60E-12	x	0.00E+00	=	0.00E+00	1.75E-12	/[	1.00E-01	x	1000	]=	1.75E-14
Styrene	8.19E-12	x	0.00E+00	=	0.00E+00	8.96E-12	/[	1.00E+00	x	1000	]=	8.96E-15
Toluene	1.22E-11	x	0.00E+00	=	0.00E+00	1.34E-11	/[	5.00E+00	x	1000	]=	2.68E-15
Xylenes (total)	5.80E-12	x	0.00E+00	=	0.00E+00	6.34E-12	/[	1.00E-01	x	1000	]=	6.34E-14
beta-BHC	3.16E-10	x	5.30E-04	=	1.68E-13	3.46E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	6.39E-11	x	3.10E-04	=	1.98E-14	6.99E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.58E-10	x	5.70E-04	=	1.47E-13	2.82E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.06E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.45E-07	x	1.50E+00	=	8.18E-07	5.96E-07	/	3.00E-04	=	1.99E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	6.07E-10	x		=	NA	6.64E-10	/	2.50E-05	=	2.66E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	2.10E-06	x	1.40E-02	=	2.94E-08	2.30E-06	/	2.00E-02	=	1.15E-04
Butylbenzylphthalate	3.09E-08	x	1.90E-03	=	5.86E-11	3.38E-08	/	2.00E-01	=	1.69E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	1.32E-08	x	1.80E+00	=	2.37E-08	1.44E-08	/		=	NA
Gamma-BHC (Lindane)	1.06E-09	x	1.10E+00	=	1.17E-09	1.16E-09	/	3.00E-04	=	3.88E-06
Aroclor-1260	1.50E-08	x	2.00E+00	=	3.01E-08	1.64E-08	/		=	NA
			Pathway total =		9.02E-07			Pathway total =		2.13E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	3.9E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-03
Arsenic	Sum of all pathways	=	2.81E-05	97%	Sum of all pathways	=	6.8E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.7E-03
Beryllium	Sum of all pathways	=	8.96E-12	0%	Sum of all pathways	=	8.5E-04
Cadmium	Sum of all pathways	=	2.63E-12	0%	Sum of all pathways	=	6.9E-04
Chromium	Sum of all pathways	=	9.44E-09	0%	Sum of all pathways	=	1.7E-02
Cobalt	Sum of all pathways	=	9.22E-10	0%	Sum of all pathways	=	1.6E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-09
Nickel	Sum of all pathways	=	3.66E-11	0%	Sum of all pathways	=	3.2E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	5.8E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	5.8E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	6.1E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	8.0E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	7.3E-04
2-Butanone	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	3.24E-07	1%	Sum of all pathways	=	1.3E-03
Butylbenzylphthalate	Sum of all pathways	=	6.47E-10		Sum of all pathways	=	1.9E-06
Hexane	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-06
Methylene chloride	Sum of all pathways	=	2.09E-11		Sum of all pathways	=	1.9E-06
o-Xylene	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-09
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-08
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	7.0E-08
Xylenes (total)	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-08
beta-BHC	Sum of all pathways	=	2.61E-07	1%	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	3.05E-08	0%	Sum of all pathways	=	1.0E-04
Aroclor-1260	Sum of all pathways	=	2.45E-07		Sum of all pathways	=	NA

Total Carcinogenic Risk All Pathways and Chemicals	=	**3E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	6.10E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	3.66E-02	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.34E-06	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	2.62E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.73E-04	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.04E-06	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.18E-07	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	8.78E-05	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	5.32E-05	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.37E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	8.66E-06	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.36E-01	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	3.95E-05	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.13E-03	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	1.04E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	6.84E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	1.69E-04	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	6.79E-06	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	5.13E-06	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	3.42E-07	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.74E-04	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	2.85E-06	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.46E-04	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.34E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.04E-06	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	2.98E-06	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	2.06E-09	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	3.23E-09	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.00E-02	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.46E-06	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.87E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	5.17E-04	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.14E-06	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	7.85E-07	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	9.60E-05	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	5.82E-05	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	6.97E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	9.47E-06	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.49E-01	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.32E-05	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.33E-03	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	1.14E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	7.48E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	1.85E-04	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	7.43E-06	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	5.61E-06	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	3.74E-07	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.91E-04	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.12E-06	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.78E-04	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.56E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	1.14E-06	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	3.26E-06	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	2.25E-09	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	3.53E-09	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.77E-05	=	[	9.6E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.20E-09	=	[	3.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.29E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.13E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.49E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.72E-09	=	[	1.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	2.10E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.28E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.53E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.08E-08	=	[	2.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.27E-04	=	[	3.6E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	9.47E-08	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.11E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	2.50E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.64E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	4.06E-07	=	[	4.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.63E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	1.23E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	8.20E-10	=	[	9.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.18E-07	=	[	4.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	6.83E-09	=	[	7.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.28E-07	=	[	9.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.61E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.50E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	7.14E-09	=	[	7.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	4.93E-12	=	[	5.4E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	7.74E-12	=	[	8.5E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.60E-05	=	[	9.6E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.50E-09	=	[	3.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.24E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.72E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.88E-09	=	[	1.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	2.30E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.39E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.27E-08	=	[	2.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.57E-04	=	[	3.6E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.04E-07	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.59E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.79E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	4.44E-07	=	[	4.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.78E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	1.35E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	8.97E-10	=	[	9.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.57E-07	=	[	4.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	7.47E-09	=	[	7.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	9.06E-07	=	[	9.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.13E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	2.74E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Di-n-butylphthalate	7.81E-09	=	[	7.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	5.40E-12	=	[	5.4E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	8.47E-12	=	[	8.5E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	7.85E-07	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.16E-10	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.04E-07	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	2.97E-07	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.58E-07	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	7.83E-10	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	1.14E-07	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	3.25E-07	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.66E-02	x	0.00E+00	=	0.00E+00	4.00E-02	/	1.00E+00	=	4.00E-02
Antimony	1.34E-06	x	0.00E+00	=	0.00E+00	1.46E-06	/	4.00E-04	=	3.65E-03
Arsenic	2.62E-05	x	1.50E+00	=	3.93E-05	2.87E-05	/	3.00E-04	=	9.56E-02
Barium	4.73E-04	x	0.00E+00	=	0.00E+00	5.17E-04	/	2.00E-01	=	2.58E-03
Beryllium	1.04E-06	x	0.00E+00	=	0.00E+00	1.14E-06	/	2.00E-03	=	5.68E-04
Cadmium	7.18E-07	x	0.00E+00	=	0.00E+00	7.85E-07	/	1.00E-03	=	7.85E-04
Chromium	8.78E-05	x	0.00E+00	=	0.00E+00	9.60E-05	/	3.00E-03	=	3.20E-02
Cobalt	5.32E-05	x	0.00E+00	=	0.00E+00	5.82E-05	/	3.00E-04	=	1.94E-01
Copper	6.37E-05	x	0.00E+00	=	0.00E+00	6.97E-05	/	4.00E-02	=	1.74E-03
Fluoride	8.66E-06	x	0.00E+00	=	0.00E+00	9.47E-06	/	4.00E-02	=	2.37E-04
Iron	1.36E-01	x	0.00E+00	=	0.00E+00	1.49E-01	/	7.00E-01	=	2.13E-01
Lithium	3.95E-05	x	0.00E+00	=	0.00E+00	4.32E-05	/	2.00E-03	=	2.16E-02
Manganese	2.13E-03	x	0.00E+00	=	0.00E+00	2.33E-03	/	1.40E-01	=	1.67E-02
Molybdenum	1.04E-05	x	0.00E+00	=	0.00E+00	1.14E-05	/	5.00E-03	=	2.29E-03
Nickel	6.84E-05	x	0.00E+00	=	0.00E+00	7.48E-05	/	2.00E-02	=	3.74E-03
Nitrate	1.69E-04	x	0.00E+00	=	0.00E+00	1.85E-04	/	7.10E+00	=	2.61E-05
Nitrite	6.79E-06	x	0.00E+00	=	0.00E+00	7.43E-06	/	3.00E-01	=	2.48E-05
Selenium	5.13E-06	x	0.00E+00	=	0.00E+00	5.61E-06	/	5.00E-03	=	1.12E-03
Silver	3.42E-07	x	0.00E+00	=	0.00E+00	3.74E-07	/	5.00E-03	=	7.48E-05
Strontium	1.74E-04	x	0.00E+00	=	0.00E+00	1.91E-04	/	6.00E-01	=	3.18E-04
Total Uranium	2.85E-06	x	0.00E+00	=	0.00E+00	3.12E-06	/	3.00E-03	=	1.04E-03
Vanadium	3.46E-04	x	0.00E+00	=	0.00E+00	3.78E-04	/	5.00E-03	=	7.56E-02
Zinc	2.34E-04	x	0.00E+00	=	0.00E+00	2.56E-04	/	3.00E-01	=	8.53E-04
Butylbenzylphthalate	1.04E-06	x	1.90E-03	=	1.99E-09	1.14E-06	/	2.00E-01	=	5.71E-06
Di-n-butylphthalate	2.98E-06	x	0.00E+00	=	0.00E+00	3.26E-06	/	1.00E-01	=	3.26E-05
Styrene	2.06E-09	x	0.00E+00	=	0.00E+00	2.25E-09	/	2.00E-01	=	1.13E-08
Toluene	3.23E-09	x	0.00E+00	=	0.00E+00	3.53E-09	/	8.00E-02	=	4.42E-08
			Pathway total	=	3.93E-05			Pathway total	=	7.07E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.77E-05	x		=	NA	9.60E-05	/[	5.00E-03	x	1000	]=	1.92E-05
Antimony	3.20E-09	x		=	NA	3.50E-09	/[		x	1000	]=	NA
Arsenic	6.29E-08	x	4.30E-03	=	2.70E-10	6.88E-08	/[	1.50E-05	x	1000	]=	4.58E-06
Barium	1.13E-06	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.48E-06
Beryllium	2.49E-09	x	2.40E-03	=	5.98E-12	2.72E-09	/[	2.00E-05	x	1001	]=	1.36E-07
Cadmium	1.72E-09	x	1.80E-03	=	3.10E-12	1.88E-09	/[	1.00E-05	x	1002	]=	1.88E-07
Chromium	2.10E-07	x	8.40E-02	=	1.77E-08	2.30E-07	/[	1.00E-04	x	1003	]=	2.29E-06
Cobalt	1.28E-07	x	9.00E-03	=	1.15E-09	1.39E-07	/[	6.00E-06	x	1004	]=	2.32E-05
Copper	1.53E-07	x		=	NA	1.67E-07	/[		x	1005	]=	NA
Fluoride	2.08E-08	x		=	NA	2.27E-08	/[	1.30E-02	x	1000	]=	1.75E-09
Iron	3.27E-04	x		=	NA	3.57E-04	/[		x	1000	]=	NA
Lithium	9.47E-08	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Manganese	5.11E-06	x		=	NA	5.59E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Molybdenum	2.50E-08	x	0.00E+00	=	0.00E+00	2.74E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.64E-07	x	2.60E-04	=	4.26E-11	1.79E-07	/[	9.00E-05	x	1000	]=	1.99E-06
Nitrate	4.06E-07	x		=	NA	4.44E-07	/[		x	1000	]=	NA
Nitrite	1.63E-08	x		=	NA	1.78E-08	/[		x	1000	]=	NA
Selenium	1.23E-08	x	0.00E+00	=	0.00E+00	1.35E-08	/[	2.00E-02	x	1000	]=	6.73E-10
Silver	8.20E-10	x		=	NA	8.97E-10	/[		x	1000	]=	NA
Strontium	4.18E-07	x		=	NA	4.57E-07	/[		x	1000	]=	NA
Total Uranium	6.83E-09	x		=	NA	7.47E-09	/[	4.00E-05	x	1000	]=	1.87E-07
Vanadium	8.28E-07	x		=	NA	9.06E-07	/[	1.00E-04	x	1000	]=	9.06E-06
Zinc	5.61E-07	x		=	NA	6.13E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.50E-09	x	0.00E+00	=	0.00E+00	2.74E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	7.14E-09	x	0.00E+00	=	0.00E+00	7.81E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.93E-12	x	0.00E+00	=	0.00E+00	5.40E-12	/[	1.00E+00	x	1000	]=	5.40E-15
Toluene	7.74E-12	x	0.00E+00	=	0.00E+00	8.47E-12	/	5.00E+00	x	1000	]=	1.69E-15
			Pathway total =		1.91E-08					Pathway total =		1.75E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.85E-07	x	1.50E+00	=	1.18E-06	8.58E-07	/	3.00E-04	=	2.86E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.16E-10	x		=	NA	7.83E-10	/	2.50E-05	=	3.13E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.04E-07	x	1.90E-03	=	1.98E-10	1.14E-07	/	2.00E-01	=	5.70E-07
Di-n-butylphthalate	2.97E-07	x		=	NA	3.25E-07	/	1.00E-01	=	3.25E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.18E-06			Pathway total =		2.90E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-03
Arsenic	Sum of all pathways	=	4.05E-05	100%	Sum of all pathways	=	9.8E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-03
Beryllium	Sum of all pathways	=	5.98E-12		Sum of all pathways	=	5.7E-04
Cadmium	Sum of all pathways	=	3.10E-12		Sum of all pathways	=	8.2E-04
Chromium	Sum of all pathways	=	1.77E-08		Sum of all pathways	=	3.2E-02
Cobalt	Sum of all pathways	=	1.15E-09		Sum of all pathways	=	1.9E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-02
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-03
Nickel	Sum of all pathways	=	4.26E-11		Sum of all pathways	=	3.7E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-05
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.5E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	7.5E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	7.6E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	8.5E-04
Butylbenzylphthalate	Sum of all pathways	=	2.18E-09		Sum of all pathways	=	6.3E-06
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-05
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-08
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-08

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**4E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	7.11E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.04E-02	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.13E-05	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	4.12E-05	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	1.27E-03	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.71E-06	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	2.29E-04	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.90E-07	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	6.06E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.32E-05	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	7.21E-05	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	7.99E-06	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.26E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.53E-05	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.00E-03	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	8.46E-08	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	7.16E-05	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	4.82E-05	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.31E-05	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	3.26E-07	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	6.53E-04	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	1.88E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.40E-06	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	2.84E-04	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.73E-04	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.08E-05	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.06E-07	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	4.42E-02	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.23E-05	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	4.51E-05	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	1.39E-03	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.87E-06	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	2.51E-04	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.46E-07	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	6.63E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	4.73E-05	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	7.89E-05	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	8.74E-06	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.38E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.96E-05	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.19E-03	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	9.26E-08	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	7.83E-05	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	5.27E-05	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.43E-05	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	3.57E-07	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	7.14E-04	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	2.06E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.72E-06	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.10E-04	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.99E-04	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.18E-05	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.45E-07	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.69E-05	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.71E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	9.88E-08	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	3.06E-06	=	[	3.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	4.11E-09	=	[	4.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	5.50E-07	=	[	6.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.42E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.45E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.04E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.73E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.92E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.02E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.09E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.80E-06	=	[	5.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.03E-10	=	[	2.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.72E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.16E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.13E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	7.82E-10	=	[	8.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	1.57E-06	=	[	1.7E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	4.51E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.15E-09	=	[	8.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	6.80E-07	=	[	7.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.55E-07	=	[	7.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.59E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.74E-10	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.06E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	2.96E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	1.08E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	3.34E-06	=	[	3.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	4.49E-09	=	[	4.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	6.01E-07	=	[	6.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.55E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.13E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.89E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.10E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.19E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.25E-06	=	[	5.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.22E-10	=	[	2.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.88E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.26E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	3.42E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	8.55E-10	=	[	8.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	1.71E-06	=	[	1.7E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	4.93E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	8.91E-09	=	[	8.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	7.44E-07	=	[	7.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	7.16E-07	=	[	7.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	2.84E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.07E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.23E-06	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.89E-10	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.08E-06	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.05E-08	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.35E-06	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.44E-10	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.18E-06	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.43E-08	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.04E-02	x	0.00E+00	=	0.00E+00	4.42E-02	/	1.00E+00	=	4.42E-02
Antimony	1.13E-05	x	0.00E+00	=	0.00E+00	1.23E-05	/	4.00E-04	=	3.09E-02
Arsenic	4.12E-05	x	1.50E+00	=	6.18E-05	4.51E-05	/	3.00E-04	=	1.50E-01
Barium	1.27E-03	x	0.00E+00	=	0.00E+00	1.39E-03	/	2.00E-01	=	6.97E-03
Beryllium	1.71E-06	x	0.00E+00	=	0.00E+00	1.87E-06	/	2.00E-03	=	9.37E-04
Boron	2.29E-04	x	0.00E+00	=	0.00E+00	2.51E-04	/	2.00E-01	=	1.25E-03
Cadmium	5.90E-07	x	0.00E+00	=	0.00E+00	6.46E-07	/	1.00E-03	=	6.46E-04
Chromium	6.06E-05	x	0.00E+00	=	0.00E+00	6.63E-05	/	3.00E-03	=	2.21E-02
Cobalt	4.32E-05	x	0.00E+00	=	0.00E+00	4.73E-05	/	3.00E-04	=	1.58E-01
Copper	7.21E-05	x	0.00E+00	=	0.00E+00	7.89E-05	/	4.00E-02	=	1.97E-03
Fluoride	7.99E-06	x	0.00E+00	=	0.00E+00	8.74E-06	/	4.00E-02	=	2.19E-04
Iron	1.26E-01	x	0.00E+00	=	0.00E+00	1.38E-01	/	7.00E-01	=	1.97E-01
Lithium	4.53E-05	x	0.00E+00	=	0.00E+00	4.96E-05	/	2.00E-03	=	2.48E-02
Manganese	2.00E-03	x	0.00E+00	=	0.00E+00	2.19E-03	/	1.40E-01	=	1.56E-02
Mercury	8.46E-08	x	0.00E+00	=	0.00E+00	9.26E-08	/	0.00E+00	=	NA
Nickel	7.16E-05	x	0.00E+00	=	0.00E+00	7.83E-05	/	2.00E-02	=	3.91E-03
Nitrate	4.82E-05	x	0.00E+00	=	0.00E+00	5.27E-05	/	7.10E+00	=	7.43E-06
Nitrite	1.31E-05	x	0.00E+00	=	0.00E+00	1.43E-05	/	3.00E-01	=	4.76E-05
Silver	3.26E-07	x	0.00E+00	=	0.00E+00	3.57E-07	/	5.00E-03	=	7.13E-05
Strontium	6.53E-04	x	0.00E+00	=	0.00E+00	7.14E-04	/	6.00E-01	=	1.19E-03
Tin	1.88E-05	x	0.00E+00	=	0.00E+00	2.06E-05	/	6.00E-01	=	3.43E-05
Total Uranium	3.40E-06	x	0.00E+00	=	0.00E+00	3.72E-06	/	3.00E-03	=	1.24E-03
Vanadium	2.84E-04	x	0.00E+00	=	0.00E+00	3.10E-04	/	5.00E-03	=	6.21E-02
Zinc	2.73E-04	x	0.00E+00	=	0.00E+00	2.99E-04	/	3.00E-01	=	9.96E-04
Bis(2-ethylhexyl) phthalate	1.08E-05	x	1.40E-02	=	1.51E-07	1.18E-05	/	2.00E-02	=	5.91E-04
Butylbenzylphthalate	4.06E-07	x	1.90E-03	=	7.72E-10	4.45E-07	/	2.00E-01	=	2.22E-06
			Pathway total	=	6.20E-05			Pathway total	=	7.24E-01

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.69E-05	x		=	NA	1.06E-04	/[	5.00E-03	x	1000	]=	2.12E-05
Antimony	2.71E-08	x		=	NA	2.96E-08	/[		x	1000	]=	NA
Arsenic	9.88E-08	x	4.30E-03	=	4.25E-10	1.08E-07	/[	1.50E-05	x	1000	]=	7.21E-06
Barium	3.06E-06	x		=	NA	3.34E-06	/[	5.00E-04	x	1000	]=	6.68E-06
Beryllium	4.11E-09	x	2.40E-03	=	9.86E-12	4.49E-09	/[	2.00E-05	x	1000	]=	2.25E-07
Boron	5.50E-07	x	0.00E+00	=	0.00E+00	6.01E-07	/[	2.00E-02	x	1000	]=	3.01E-08
Cadmium	1.42E-09	x	1.80E-03	=	2.55E-12	1.55E-09	/[	1.00E-05	x	1000	]=	1.55E-07
Chromium	1.45E-07	x	8.40E-02	=	1.22E-08	1.59E-07	/[	1.00E-04	x	1000	]=	1.59E-06
Cobalt	1.04E-07	x	9.00E-03	=	9.32E-10	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.73E-07	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Fluoride	1.92E-08	x		=	NA	2.10E-08	/[	1.30E-02	x	1000	]=	1.61E-09
Iron	3.02E-04	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.09E-07	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	4.80E-06	x		=	NA	5.25E-06	/[	5.00E-05	x	1000	]=	1.05E-04
Mercury	2.03E-10	x	0.00E+00	=	0.00E+00	2.22E-10	/[	3.00E-04	x	1000	]=	7.40E-10
Nickel	1.72E-07	x	2.60E-04	=	4.46E-11	1.88E-07	/[	9.00E-05	x	1000	]=	2.09E-06
Nitrate	1.16E-07	x		=	NA	1.26E-07	/[		x	1000	]=	NA
Nitrite	3.13E-08	x		=	NA	3.42E-08	/[		x	1000	]=	NA
Silver	7.82E-10	x		=	NA	8.55E-10	/[		x	1000	]=	NA
Strontium	1.57E-06	x		=	NA	1.71E-06	/[		x	1000	]=	NA
Tin	4.51E-08	x		=	NA	4.93E-08	/[		x	1000	]=	NA
Total Uranium	8.15E-09	x		=	NA	8.91E-09	/[	4.00E-05	x	1000	]=	2.23E-07
Vanadium	6.80E-07	x		=	NA	7.44E-07	/[	1.00E-04	x	1000	]=	7.44E-06
Zinc	6.55E-07	x		=	NA	7.16E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.59E-08	x	2.40E-06	=	6.22E-14	2.84E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	9.74E-10	x	0.00E+00	=	0.00E+00	1.07E-09	/		x	1000	]=	NA
			Pathway total =		1.36E-08					Pathway total =		1.71E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.23E-06	x	1.50E+00	=	1.85E-06	1.35E-06	/	3.00E-04	=	4.50E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	5.89E-10	x		=	NA	6.44E-10	/	2.50E-05	=	2.58E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	1.08E-06	x	1.40E-02	=	1.51E-08	1.18E-06	/	2.00E-02	=	5.90E-05
Butylbenzylphthalate	4.05E-08	x	1.90E-03	=	7.70E-11	4.43E-08	/	2.00E-01	=	2.22E-07
			Pathway total =		1.87E-06			Pathway total =		4.58E-03

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-02
Arsenic	Sum of all pathways	=	6.37E-05	100%	Sum of all pathways	=	1.5E-01
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	7.0E-03
Beryllium	Sum of all pathways	=	9.86E-12		Sum of all pathways	=	9.4E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Cadmium	Sum of all pathways	=	2.55E-12		Sum of all pathways	=	6.7E-04
Chromium	Sum of all pathways	=	1.22E-08		Sum of all pathways	=	2.2E-02
Cobalt	Sum of all pathways	=	9.32E-10		Sum of all pathways	=	1.6E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.5E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-10
Nickel	Sum of all pathways	=	4.46E-11		Sum of all pathways	=	3.9E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.8E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	7.1E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-03
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.67E-07		Sum of all pathways	=	6.5E-04
Butylbenzylphthalate	Sum of all pathways	=	8.49E-10		Sum of all pathways	=	2.4E-06

Total Carcinogenic Risk All Pathways and Chemicals	=	**6E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	7.29E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.34E-02	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.41E-06	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.88E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.36E-04	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	8.56E-07	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.00E-07	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	5.06E-05	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.32E-05	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.36E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	6.60E-06	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.10E-01	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	3.69E-05	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.86E-03	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	8.93E-08	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	1.28E-05	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	6.86E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	4.01E-05	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.62E-05	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	7.05E-06	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	4.91E-07	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.62E-04	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.59E-06	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.09E-04	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.99E-04	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	2.41E-07	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
1-Butanol	1.16E-07	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	9.61E-06	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	3.16E-07	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.18E-07	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	3.66E-02	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.54E-06	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.06E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	4.77E-04	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	9.36E-07	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.47E-07	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	5.53E-05	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	4.72E-05	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	6.96E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	7.22E-06	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.20E-01	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.04E-05	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.03E-03	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	9.77E-08	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	1.40E-05	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	7.50E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	4.39E-05	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.77E-05	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	7.71E-06	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	5.37E-07	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.77E-04	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.93E-06	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.38E-04	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.17E-04	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	2.64E-07	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
1-Butanol	1.27E-07	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.05E-05	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.38E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	3.46E-07	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.29E-07	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.01E-05	=	[	8.8E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.37E-09	=	[	3.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.51E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.05E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.05E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.20E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.21E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.52E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.58E-08	=	[	1.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	2.64E-04	=	[	2.9E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	8.85E-08	=	[	9.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.46E-06	=	[	4.9E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.14E-10	=	[	2.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	3.07E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.64E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	9.62E-08	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.88E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	1.69E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.18E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	3.88E-07	=	[	4.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.61E-09	=	[	9.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.40E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	4.76E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	5.79E-10	=	[	6.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
1-Butanol	2.78E-10	=	[	3.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.30E-08	=	[	2.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.41E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Hexane	7.58E-10	=	[	8.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	2.84E-10	=	[	3.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.76E-05	=	[	8.8E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.69E-09	=	[	3.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	4.93E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.14E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.24E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.31E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.33E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.13E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	1.73E-08	=	[	1.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	2.89E-04	=	[	2.9E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	9.68E-08	=	[	9.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.88E-06	=	[	4.9E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.34E-10	=	[	2.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	3.36E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.80E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.05E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	4.25E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	1.85E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.29E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.25E-07	=	[	4.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.42E-09	=	[	9.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.10E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	5.21E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	6.33E-10	=	[	6.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
1-Butanol	3.04E-10	=	[	3.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	2.52E-08	=	[	2.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Hexane	8.29E-10	=	[	8.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.10E-10	=	[	3.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.63E-07	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	4.98E-10	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
1-Butanol	1.16E-08	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	9.59E-07	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.18E-08	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	6.15E-07	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.45E-10	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
1-Butanol	1.27E-08	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.05E-06	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.37E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.29E-08	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.34E-02	x	0.00E+00	=	0.00E+00	3.66E-02	/	1.00E+00	=	3.66E-02
Antimony	1.41E-06	x	0.00E+00	=	0.00E+00	1.54E-06	/	4.00E-04	=	3.85E-03
Arsenic	1.88E-05	x	1.50E+00	=	2.82E-05	2.06E-05	/	3.00E-04	=	6.86E-02
Barium	4.36E-04	x	0.00E+00	=	0.00E+00	4.77E-04	/	2.00E-01	=	2.38E-03
Beryllium	8.56E-07	x	0.00E+00	=	0.00E+00	9.36E-07	/	2.00E-03	=	4.68E-04
Cadmium	5.00E-07	x	0.00E+00	=	0.00E+00	5.47E-07	/	1.00E-03	=	5.47E-04
Chromium	5.06E-05	x	0.00E+00	=	0.00E+00	5.53E-05	/	3.00E-03	=	1.84E-02
Cobalt	4.32E-05	x	0.00E+00	=	0.00E+00	4.72E-05	/	3.00E-04	=	1.57E-01
Copper	6.36E-05	x	0.00E+00	=	0.00E+00	6.96E-05	/	4.00E-02	=	1.74E-03
Fluoride	6.60E-06	x	0.00E+00	=	0.00E+00	7.22E-06	/	4.00E-02	=	1.81E-04
Iron	1.10E-01	x	0.00E+00	=	0.00E+00	1.20E-01	/	7.00E-01	=	1.72E-01
Lithium	3.69E-05	x	0.00E+00	=	0.00E+00	4.04E-05	/	2.00E-03	=	2.02E-02
Manganese	1.86E-03	x	0.00E+00	=	0.00E+00	2.03E-03	/	1.40E-01	=	1.45E-02
Mercury	8.93E-08	x	0.00E+00	=	0.00E+00	9.77E-08	/	0.00E+00	=	NA
Molybdenum	1.28E-05	x	0.00E+00	=	0.00E+00	1.40E-05	/	5.00E-03	=	2.80E-03
Nickel	6.86E-05	x	0.00E+00	=	0.00E+00	7.50E-05	/	2.00E-02	=	3.75E-03
Nitrate	4.01E-05	x	0.00E+00	=	0.00E+00	4.39E-05	/	7.10E+00	=	6.18E-06
Nitrite	1.62E-05	x	0.00E+00	=	0.00E+00	1.77E-05	/	3.00E-01	=	5.90E-05
Selenium	7.05E-06	x	0.00E+00	=	0.00E+00	7.71E-06	/	5.00E-03	=	1.54E-03
Silver	4.91E-07	x	0.00E+00	=	0.00E+00	5.37E-07	/	5.00E-03	=	1.07E-04
Strontium	1.62E-04	x	0.00E+00	=	0.00E+00	1.77E-04	/	6.00E-01	=	2.95E-04
Total Uranium	3.59E-06	x	0.00E+00	=	0.00E+00	3.93E-06	/	3.00E-03	=	1.31E-03
Vanadium	3.09E-04	x	0.00E+00	=	0.00E+00	3.38E-04	/	5.00E-03	=	6.76E-02
Zinc	1.99E-04	x	0.00E+00	=	0.00E+00	2.17E-04	/	3.00E-01	=	7.24E-04
Acetone	2.41E-07	x	0.00E+00	=	0.00E+00	2.64E-07	/	9.00E-01	=	2.93E-07
1-Butanol	1.16E-07	x	0.00E+00	=	0.00E+00	1.27E-07	/	1.00E-01	=	1.27E-06
Bis(2-ethylhexyl) phthalate	9.61E-06	x	1.40E-02	=	1.35E-07	1.05E-05	/	2.00E-02	=	5.26E-04
Butylbenzylphthalate	3.09E-07	x	1.90E-03	=	5.88E-10	3.38E-07	/	2.00E-01	=	1.69E-06
Hexane	3.16E-07	x	0.00E+00	=	0.00E+00	3.46E-07	/	6.00E-02	=	5.76E-06
beta-BHC	1.18E-07	x	1.80E+00	=	2.13E-07	1.29E-07	/	0.00E+00	=	NA
			Pathway total	=	2.86E-05			Pathway total	=	5.75E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.01E-05	x		=	NA	8.76E-05	/[	5.00E-03	x	1000	]=	1.75E-05
Antimony	3.37E-09	x		=	NA	3.69E-09	/[		x	1000	]=	NA
Arsenic	4.51E-08	x	4.30E-03	=	1.94E-10	4.93E-08	/[	1.50E-05	x	1000	]=	3.29E-06
Barium	1.05E-06	x		=	NA	1.14E-06	/[	5.00E-04	x	1000	]=	2.29E-06
Beryllium	2.05E-09	x	2.40E-03	=	4.93E-12	2.24E-09	/[	2.00E-05	x	1000	]=	1.12E-07
Cadmium	1.20E-09	x	1.80E-03	=	2.16E-12	1.31E-09	/[	1.00E-05	x	1000	]=	1.31E-07
Chromium	1.21E-07	x	8.40E-02	=	1.02E-08	1.33E-07	/[	1.00E-04	x	1000	]=	1.33E-06
Cobalt	1.03E-07	x	9.00E-03	=	9.31E-10	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.52E-07	x		=	NA	1.67E-07	/[		x	1000	]=	NA
Fluoride	1.58E-08	x		=	NA	1.73E-08	/[	1.30E-02	x	1000	]=	1.33E-09
Iron	2.64E-04	x		=	NA	2.89E-04	/[		x	1000	]=	NA
Lithium	8.85E-08	x		=	NA	9.68E-08	/[		x	1000	]=	NA
Manganese	4.46E-06	x		=	NA	4.88E-06	/[	5.00E-05	x	1000	]=	9.75E-05
Mercury	2.14E-10	x	0.00E+00	=	0.00E+00	2.34E-10	/[	3.00E-04	x	1000	]=	7.81E-10
Molybdenum	3.07E-08	x	0.00E+00	=	0.00E+00	3.36E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.64E-07	x	2.60E-04	=	4.28E-11	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	9.62E-08	x		=	NA	1.05E-07	/[		x	1000	]=	NA
Nitrite	3.88E-08	x		=	NA	4.25E-08	/[		x	1000	]=	NA
Selenium	1.69E-08	x	0.00E+00	=	0.00E+00	1.85E-08	/[	2.00E-02	x	1000	]=	9.25E-10
Silver	1.18E-09	x		=	NA	1.29E-09	/[		x	1000	]=	NA
Strontium	3.88E-07	x		=	NA	4.25E-07	/[		x	1000	]=	NA
Total Uranium	8.61E-09	x		=	NA	9.42E-09	/[	4.00E-05	x	1000	]=	2.36E-07
Vanadium	7.40E-07	x		=	NA	8.10E-07	/[	1.00E-04	x	1000	]=	8.10E-06
Zinc	4.76E-07	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Acetone	5.79E-10	x	0.00E+00	=	0.00E+00	6.33E-10	/[	3.10E+01	x	1000	]=	2.04E-14
1-Butanol	2.78E-10	x	0.00E+00	=	0.00E+00	3.04E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.30E-08	x	2.40E-06	=	5.53E-14	2.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	7.41E-10	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	7.58E-10	x	0.00E+00	=	0.00E+00	8.29E-10	/[	7.00E-01	x	1000	]=	1.18E-12
beta-BHC	2.84E-10	x	5.30E-04	=	1.50E-13	3.10E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.14E-08					Pathway total =		1.51E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.63E-07	x	1.50E+00	=	8.44E-07	6.15E-07	/	3.00E-04	=	2.05E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.98E-10	x		=	NA	5.45E-10	/	2.50E-05	=	2.18E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	1.16E-08	x		=	NA	1.27E-08	/	1.00E-01	=	1.27E-07
Bis(2-ethylhexyl) phthalate	9.59E-07	x	1.40E-02	=	1.34E-08	1.05E-06	/	2.00E-02	=	5.24E-05
Butylbenzylphthalate	3.09E-08	x	1.90E-03	=	5.86E-11	3.37E-08	/	2.00E-01	=	1.69E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	1.18E-08	x	1.80E+00	=	2.12E-08	1.29E-08	/		=	NA
			Pathway total =		8.79E-07			Pathway total =		2.13E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.8E-03
Arsenic	Sum of all pathways	=	2.90E-05	99%	Sum of all pathways	=	7.1E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-03
Beryllium	Sum of all pathways	=	4.93E-12		Sum of all pathways	=	4.7E-04
Cadmium	Sum of all pathways	=	2.16E-12		Sum of all pathways	=	5.7E-04
Chromium	Sum of all pathways	=	1.02E-08		Sum of all pathways	=	1.8E-02
Cobalt	Sum of all pathways	=	9.31E-10		Sum of all pathways	=	1.6E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.8E-10
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	2.8E-03
Nickel	Sum of all pathways	=	4.28E-11		Sum of all pathways	=	3.8E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	5.9E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	6.8E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	7.2E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-07
1-Butanol	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-06
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.48E-07		Sum of all pathways	=	5.8E-04
Butylbenzylphthalate	Sum of all pathways	=	6.46E-10		Sum of all pathways	=	1.9E-06
Hexane	Sum of all pathways	=	NA		Sum of all pathways	=	5.8E-06
beta-BHC	Sum of all pathways	=	2.34E-07		Sum of all pathways	=	NA

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**3E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	5.78E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	3.72E-02	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.23E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	2.65E-05	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.26E-04	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.44E-06	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.31E-07	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	6.48E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.78E-05	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.67E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.50E-05	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.32E-01	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.37E-05	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.90E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	1.00E-07	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	5.80E-05	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	5.97E-05	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	2.41E-05	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	9.27E-07	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.73E-04	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	7.52E-05	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	8.19E-06	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	4.06E-04	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	9.58E-04	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	5.12E-08	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.20E-05	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	4.51E-06	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	7.00E-09	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	1.54E-09	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.35E-07	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.40E-07	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.07E-02	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.34E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.89E-05	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	4.66E-04	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.58E-06	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.90E-07	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	7.09E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	5.23E-05	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	7.30E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.64E-05	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.45E-01	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	4.78E-05	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.08E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	1.10E-07	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	6.35E-05	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	6.54E-05	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	2.63E-05	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	1.01E-06	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.89E-04	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	8.23E-05	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	8.96E-06	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	4.44E-04	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.05E-03	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	5.60E-08	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.31E-05	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	4.93E-06	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	7.66E-09	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	1.68E-09	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.47E-07	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	1.53E-07	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.93E-05	=	[	9.8E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.95E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.34E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.02E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	3.46E-09	=	[	3.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.51E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.55E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.15E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	3.60E-08	=	[	3.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.17E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.05E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.56E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.40E-10	=	[	2.6E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.39E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.43E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	5.77E-08	=	[	6.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	2.22E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.15E-07	=	[	4.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	1.80E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.96E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	9.74E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	2.30E-06	=	[	2.5E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	1.23E-10	=	[	1.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	0.00E+00	=	[	0.0E+00	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	1.08E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	1.68E-11	=	[	1.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	3.68E-12	=	[	4.0E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	3.23E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.36E-10	=	[	3.7E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.76E-05	=	[	9.8E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	6.94E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.12E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	3.78E-09	=	[	3.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.65E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.94E-08	=	[	3.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.47E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.15E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.63E-10	=	[	2.6E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.52E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.57E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	6.31E-08	=	[	6.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	2.43E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.54E-07	=	[	4.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	1.97E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	2.15E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	2.51E-06	=	[	2.5E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	1.34E-10	=	[	1.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	0.00E+00	=	[	0.0E+00	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Di-n-butylphthalate	1.18E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	1.84E-11	=	[	1.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	4.03E-12	=	[	4.0E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.53E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1260	3.67E-10	=	[	3.7E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	7.92E-07	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.29E-10	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.20E-06	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	4.50E-07	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.34E-08	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.96E-08	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.66E-07	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.88E-10	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.31E-06	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	4.92E-07	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.47E-08	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	2.14E-08	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	3.72E-02	x	0.00E+00	=	0.00E+00	4.07E-02	/	1.00E+00	=	4.07E-02
Antimony	1.23E-06	x	0.00E+00	=	0.00E+00	1.34E-06	/	4.00E-04	=	3.36E-03
Arsenic	2.65E-05	x	1.50E+00	=	3.97E-05	2.89E-05	/	3.00E-04	=	9.65E-02
Barium	4.26E-04	x	0.00E+00	=	0.00E+00	4.66E-04	/	2.00E-01	=	2.33E-03
Beryllium	1.44E-06	x	0.00E+00	=	0.00E+00	1.58E-06	/	2.00E-03	=	7.89E-04
Cadmium	6.31E-07	x	0.00E+00	=	0.00E+00	6.90E-07	/	1.00E-03	=	6.90E-04
Chromium	6.48E-05	x	0.00E+00	=	0.00E+00	7.09E-05	/	3.00E-03	=	2.36E-02
Cobalt	4.78E-05	x	0.00E+00	=	0.00E+00	5.23E-05	/	3.00E-04	=	1.74E-01
Copper	6.67E-05	x	0.00E+00	=	0.00E+00	7.30E-05	/	4.00E-02	=	1.82E-03
Fluoride	1.50E-05	x	0.00E+00	=	0.00E+00	1.64E-05	/	4.00E-02	=	4.10E-04
Iron	1.32E-01	x	0.00E+00	=	0.00E+00	1.45E-01	/	7.00E-01	=	2.07E-01
Lithium	4.37E-05	x	0.00E+00	=	0.00E+00	4.78E-05	/	2.00E-03	=	2.39E-02
Manganese	1.90E-03	x	0.00E+00	=	0.00E+00	2.08E-03	/	1.40E-01	=	1.49E-02
Mercury	1.00E-07	x	0.00E+00	=	0.00E+00	1.10E-07	/	0.00E+00	=	NA
Nickel	5.80E-05	x	0.00E+00	=	0.00E+00	6.35E-05	/	2.00E-02	=	3.17E-03
Nitrate	5.97E-05	x	0.00E+00	=	0.00E+00	6.54E-05	/	7.10E+00	=	9.20E-06
Nitrite	2.41E-05	x	0.00E+00	=	0.00E+00	2.63E-05	/	3.00E-01	=	8.78E-05
Silver	9.27E-07	x	0.00E+00	=	0.00E+00	1.01E-06	/	5.00E-03	=	2.03E-04
Strontium	1.73E-04	x	0.00E+00	=	0.00E+00	1.89E-04	/	6.00E-01	=	3.16E-04
Tin	7.52E-05	x	0.00E+00	=	0.00E+00	8.23E-05	/	6.00E-01	=	1.37E-04
Total Uranium	8.19E-06	x	0.00E+00	=	0.00E+00	8.96E-06	/	3.00E-03	=	2.99E-03
Vanadium	4.06E-04	x	0.00E+00	=	0.00E+00	4.44E-04	/	5.00E-03	=	8.89E-02
Zinc	9.58E-04	x	0.00E+00	=	0.00E+00	1.05E-03	/	3.00E-01	=	3.49E-03
Acetone	5.12E-08	x	0.00E+00	=	0.00E+00	5.60E-08	/	9.00E-01	=	6.22E-08
Bis(2-ethylhexyl) phthalate	1.20E-05	x	1.40E-02	=	1.68E-07	1.31E-05	/	2.00E-02	=	6.57E-04
Di-n-butylphthalate	4.51E-06	x	0.00E+00	=	0.00E+00	4.93E-06	/	1.00E-01	=	4.93E-05
Methylene chloride	7.00E-09	x	2.00E-03	=	1.40E-11	7.66E-09	/	6.00E-03	=	1.28E-06
Toluene	1.54E-09	x	0.00E+00	=	0.00E+00	1.68E-09	/	8.00E-02	=	2.10E-08
beta-BHC	1.35E-07	x	1.80E+00	=	2.43E-07	1.47E-07	/	0.00E+00	=	NA
Aroclor-1260	1.40E-07	x	2.00E+00	=	2.80E-07	1.53E-07	/	0.00E+00	=	NA
			Pathway total	=	4.04E-05			Pathway total	=	6.90E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.93E-05	x		=	NA	9.76E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	2.95E-09	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	6.34E-08	x	4.30E-03	=	2.73E-10	6.94E-08	/[	1.50E-05	x	1000	]=	4.62E-06
Barium	1.02E-06	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Beryllium	3.46E-09	x	2.40E-03	=	8.30E-12	3.78E-09	/[	2.00E-05	x	1000	]=	1.89E-07
Cadmium	1.51E-09	x	1.80E-03	=	2.72E-12	1.65E-09	/[	1.00E-05	x	1000	]=	1.65E-07
Chromium	1.55E-07	x	8.40E-02	=	1.30E-08	1.70E-07	/[	1.00E-04	x	1000	]=	1.70E-06
Cobalt	1.15E-07	x	9.00E-03	=	1.03E-09	1.25E-07	/[	6.00E-06	x	1000	]=	2.09E-05
Copper	1.60E-07	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	3.60E-08	x		=	NA	3.94E-08	/[	1.30E-02	x	1000	]=	3.03E-09
Iron	3.17E-04	x		=	NA	3.47E-04	/[		x	1000	]=	NA
Lithium	1.05E-07	x		=	NA	1.15E-07	/[		x	1000	]=	NA
Manganese	4.56E-06	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.98E-05
Mercury	2.40E-10	x	0.00E+00	=	0.00E+00	2.63E-10	/[	3.00E-04	x	1000	]=	8.77E-10
Nickel	1.39E-07	x	2.60E-04	=	3.62E-11	1.52E-07	/[	9.00E-05	x	1000	]=	1.69E-06
Nitrate	1.43E-07	x		=	NA	1.57E-07	/[		x	1000	]=	NA
Nitrite	5.77E-08	x		=	NA	6.31E-08	/[		x	1000	]=	NA
Silver	2.22E-09	x		=	NA	2.43E-09	/[		x	1000	]=	NA
Strontium	4.15E-07	x		=	NA	4.54E-07	/[		x	1000	]=	NA
Tin	1.80E-07	x		=	NA	1.97E-07	/[		x	1000	]=	NA
Total Uranium	1.96E-08	x		=	NA	2.15E-08	/[	4.00E-05	x	1000	]=	5.37E-07
Vanadium	9.74E-07	x		=	NA	1.07E-06	/[	1.00E-04	x	1000	]=	1.07E-05
Zinc	2.30E-06	x		=	NA	2.51E-06	/[		x	1000	]=	NA
Acetone	1.23E-10	x	0.00E+00	=	0.00E+00	1.34E-10	/[	3.10E+01	x	1000	]=	4.33E-15
Bis(2-ethylhexyl) phthalate	0.00E+00	x	2.40E-06	=	0.00E+00	0.00E+00	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	1.08E-08	x	0.00E+00	=	0.00E+00	1.18E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.68E-11	x	1.00E-08	=	1.68E-19	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	3.68E-12	x	0.00E+00	=	0.00E+00	4.03E-12	/[	5.00E+00	x	1000	]=	8.05E-16
beta-BHC	3.23E-10	x	5.30E-04	=	1.71E-13	3.53E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.36E-10	x	5.70E-04	=	1.91E-13	3.67E-10	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.44E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.92E-07	x	1.50E+00	=	1.19E-06	8.66E-07	/	3.00E-04	=	2.89E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	6.29E-10	x		=	NA	6.88E-10	/	2.50E-05	=	2.75E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	1.20E-06	x	1.40E-02	=	1.68E-08	1.31E-06	/	2.00E-02	=	6.56E-05
Di-n-butylphthalate	4.50E-07	x		=	NA	4.92E-07	/	1.00E-01	=	4.92E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	1.34E-08	x	1.80E+00	=	2.42E-08	1.47E-08	/		=	NA
Aroclor-1260	1.96E-08	x	2.00E+00	=	3.91E-08	2.14E-08	/		=	NA
			Pathway total =		1.27E-06			Pathway total =		2.98E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.1E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-03
Arsenic	Sum of all pathways	=	4.09E-05	98%	Sum of all pathways	=	9.9E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-03
Beryllium	Sum of all pathways	=	8.30E-12		Sum of all pathways	=	7.9E-04
Cadmium	Sum of all pathways	=	2.72E-12		Sum of all pathways	=	7.2E-04
Chromium	Sum of all pathways	=	1.30E-08		Sum of all pathways	=	2.4E-02
Cobalt	Sum of all pathways	=	1.03E-09		Sum of all pathways	=	1.7E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	4.1E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-10
Nickel	Sum of all pathways	=	3.62E-11		Sum of all pathways	=	3.2E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	9.2E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-04
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	8.9E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-03
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.85E-07		Sum of all pathways	=	7.2E-04
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	5.4E-05
Methylene chloride	Sum of all pathways	=	1.40E-11		Sum of all pathways	=	1.3E-06
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-08
beta-BHC	Sum of all pathways	=	2.67E-07		Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	3.19E-07		Sum of all pathways	=	NA

Total Carcinogenic Risk All Pathways and Chemicals	=	**4.2E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	6.93E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.38E-02	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.28E-06	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	3.05E-05	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	4.14E-04	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	9.14E-07	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.81E-05	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	5.85E-05	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	5.49E-05	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	7.73E-05	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.84E-05	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.35E-01	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.73E-05	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	2.14E-03	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	7.05E-08	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	5.75E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.07E-04	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	2.77E-05	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	3.66E-06	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	3.63E-07	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.95E-04	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.45E-06	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	3.35E-04	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.54E-04	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	3.34E-08	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.59E-07	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
2-Hexanone	1.45E-08	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	7.31E-09	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	3.09E-09	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DIingestion	=	[	CS	x	IR	x	FI	x	CF	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.79E-02	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.40E-06	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	3.33E-05	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	4.53E-04	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.00E-06	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.98E-05	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	6.40E-05	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	6.00E-05	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	8.46E-05	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	2.02E-05	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.48E-01	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	5.17E-05	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.34E-03	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	7.71E-08	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	6.29E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.27E-04	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	3.03E-05	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	4.01E-06	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	3.97E-07	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	2.13E-04	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.77E-06	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	3.67E-04	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.78E-04	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	3.66E-08	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	6.11E-07	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
2-Hexanone	1.58E-08	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	8.00E-09	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	3.38E-09	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.05E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.07E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	7.30E-08	=	[	8.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	9.92E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.19E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	4.35E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.40E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.32E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.85E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	4.42E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.24E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.13E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.12E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	1.69E-10	=	[	1.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.38E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	4.97E-07	=	[	5.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	6.65E-08	=	[	7.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	8.78E-09	=	[	9.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	8.69E-10	=	[	9.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.67E-07	=	[	5.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.26E-09	=	[	9.0E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.04E-07	=	[	8.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.09E-07	=	[	6.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	8.02E-11	=	[	8.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.34E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
2-Hexanone	3.47E-11	=	[	3.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	1.75E-11	=	[	1.9E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	7.41E-12	=	[	8.1E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.15E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.36E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	7.99E-08	=	[	8.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.40E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	4.75E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.53E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.44E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.03E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	4.84E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.55E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.60E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	1.85E-10	=	[	1.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	5.44E-07	=	[	5.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	7.27E-08	=	[	7.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	9.60E-09	=	[	9.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	9.51E-10	=	[	9.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	5.11E-07	=	[	5.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.04E-09	=	[	9.0E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.79E-07	=	[	8.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.66E-07	=	[	6.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	8.77E-11	=	[	8.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.47E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
2-Hexanone	3.79E-11	=	[	3.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	1.92E-11	=	[	1.9E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	8.11E-12	=	[	8.1E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	9.11E-07	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.81E-08	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.58E-08	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	9.97E-07	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.98E-08	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	6.10E-08	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.38E-02	x	0.00E+00	=	0.00E+00	4.79E-02	/	1.00E+00	=	4.79E-02
Antimony	1.28E-06	x	0.00E+00	=	0.00E+00	1.40E-06	/	4.00E-04	=	3.50E-03
Arsenic	3.05E-05	x	1.50E+00	=	4.57E-05	3.33E-05	/	3.00E-04	=	1.11E-01
Barium	4.14E-04	x	0.00E+00	=	0.00E+00	4.53E-04	/	2.00E-01	=	2.26E-03
Beryllium	9.14E-07	x	0.00E+00	=	0.00E+00	1.00E-06	/	2.00E-03	=	5.00E-04
Cadmium	1.81E-05	x	0.00E+00	=	0.00E+00	1.98E-05	/	1.00E-03	=	1.98E-02
Chromium	5.85E-05	x	0.00E+00	=	0.00E+00	6.40E-05	/	3.00E-03	=	2.13E-02
Cobalt	5.49E-05	x	0.00E+00	=	0.00E+00	6.00E-05	/	3.00E-04	=	2.00E-01
Copper	7.73E-05	x	0.00E+00	=	0.00E+00	8.46E-05	/	4.00E-02	=	2.11E-03
Fluoride	1.84E-05	x	0.00E+00	=	0.00E+00	2.02E-05	/	4.00E-02	=	5.04E-04
Iron	1.35E-01	x	0.00E+00	=	0.00E+00	1.48E-01	/	7.00E-01	=	2.11E-01
Lithium	4.73E-05	x	0.00E+00	=	0.00E+00	5.17E-05	/	2.00E-03	=	2.59E-02
Manganese	2.14E-03	x	0.00E+00	=	0.00E+00	2.34E-03	/	1.40E-01	=	1.67E-02
Mercury	7.05E-08	x	0.00E+00	=	0.00E+00	7.71E-08	/	0.00E+00	=	NA
Nickel	5.75E-05	x	0.00E+00	=	0.00E+00	6.29E-05	/	2.00E-02	=	3.14E-03
Nitrate	2.07E-04	x	0.00E+00	=	0.00E+00	2.27E-04	/	7.10E+00	=	3.20E-05
Nitrite	2.77E-05	x	0.00E+00	=	0.00E+00	3.03E-05	/	3.00E-01	=	1.01E-04
Selenium	3.66E-06	x	0.00E+00	=	0.00E+00	4.01E-06	/	5.00E-03	=	8.01E-04
Silver	3.63E-07	x	0.00E+00	=	0.00E+00	3.97E-07	/	5.00E-03	=	7.93E-05
Strontium	1.95E-04	x	0.00E+00	=	0.00E+00	2.13E-04	/	6.00E-01	=	3.55E-04
Total Uranium	3.45E-06	x	0.00E+00	=	0.00E+00	3.77E-06	/	3.00E-03	=	1.26E-03
Vanadium	3.35E-04	x	0.00E+00	=	0.00E+00	3.67E-04	/	5.00E-03	=	7.34E-02
Zinc	2.54E-04	x	0.00E+00	=	0.00E+00	2.78E-04	/	3.00E-01	=	9.26E-04
Acetone	3.34E-08	x	0.00E+00	=	0.00E+00	3.66E-08	/	9.00E-01	=	4.06E-08
Butylbenzylphthalate	5.59E-07	x	1.90E-03	=	1.06E-09	6.11E-07	/	2.00E-01	=	3.06E-06
2-Hexanone	1.45E-08	x	0.00E+00	=	0.00E+00	1.58E-08	/	5.00E-03	=	3.17E-06
Methylene chloride	7.31E-09	x	2.00E-03	=	1.46E-11	8.00E-09	/	6.00E-03	=	1.33E-06
Toluene	3.09E-09	x	0.00E+00	=	0.00E+00	3.38E-09	/	8.00E-02	=	4.23E-08
			Pathway total	=	4.57E-05			Pathway total	=	7.43E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	1.05E-04	x		=	NA	1.15E-04	/[	5.00E-03	x	1000	]=	2.30E-05
Antimony	3.07E-09	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	7.30E-08	x	4.30E-03	=	3.14E-10	7.99E-08	/[	1.50E-05	x	1000	]=	5.32E-06
Barium	9.92E-07	x		=	NA	1.08E-06	/[	5.00E-04	x	1000	]=	2.17E-06
Beryllium	2.19E-09	x	2.40E-03	=	5.26E-12	2.40E-09	/[	2.00E-05	x	1000	]=	1.20E-07
Cadmium	4.35E-08	x	1.80E-03	=	7.82E-11	4.75E-08	/[	1.00E-05	x	1000	]=	4.75E-06
Chromium	1.40E-07	x	8.40E-02	=	1.18E-08	1.53E-07	/[	1.00E-04	x	1000	]=	1.53E-06
Cobalt	1.32E-07	x	9.00E-03	=	1.18E-09	1.44E-07	/[	6.00E-06	x	1000	]=	2.40E-05
Copper	1.85E-07	x		=	NA	2.03E-07	/[		x	1000	]=	NA
Fluoride	4.42E-08	x		=	NA	4.84E-08	/[	1.30E-02	x	1000	]=	3.72E-09
Iron	3.24E-04	x		=	NA	3.55E-04	/[		x	1000	]=	NA
Lithium	1.13E-07	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Manganese	5.12E-06	x		=	NA	5.60E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Mercury	1.69E-10	x	0.00E+00	=	0.00E+00	1.85E-10	/[	3.00E-04	x	1000	]=	6.16E-10
Nickel	1.38E-07	x	2.60E-04	=	3.58E-11	1.51E-07	/[	9.00E-05	x	1000	]=	1.67E-06
Nitrate	4.97E-07	x		=	NA	5.44E-07	/[		x	1000	]=	NA
Nitrite	6.65E-08	x		=	NA	7.27E-08	/[		x	1000	]=	NA
Selenium	8.78E-09	x	0.00E+00	=	0.00E+00	9.60E-09	/[	2.00E-02	x	1000	]=	4.80E-10
Silver	8.69E-10	x		=	NA	9.51E-10	/[		x	1000	]=	NA
Strontium	4.67E-07	x		=	NA	5.11E-07	/[		x	1000	]=	NA
Total Uranium	8.26E-09	x		=	NA	9.04E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	8.04E-07	x		=	NA	8.79E-07	/[	1.00E-04	x	1000	]=	8.79E-06
Zinc	6.09E-07	x		=	NA	6.66E-07	/[		x	1000	]=	NA
Acetone	8.02E-11	x	0.00E+00	=	0.00E+00	8.77E-11	/[	3.10E+01	x	1000	]=	2.83E-15
Butylbenzylphthalate	1.34E-09	x	0.00E+00	=	0.00E+00	1.47E-09	/[		x	1000	]=	NA
2-Hexanone	3.47E-11	x	0.00E+00	=	0.00E+00	3.79E-11	/[	3.00E-02	x	1000	]=	1.26E-12
Methylene chloride	1.75E-11	x	1.00E-08	=	1.75E-19	1.92E-11	/[	6.00E-01	x	1000	]=	3.20E-14
Toluene	7.41E-12	x	0.00E+00	=	0.00E+00	8.11E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		1.34E-08					Pathway total =		1.84E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.11E-07	x	1.50E+00	=	1.37E-06	9.97E-07	/	3.00E-04	=	3.32E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.81E-08	x		=	NA	1.98E-08	/	2.50E-05	=	7.91E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	5.58E-08	x	1.90E-03	=	1.06E-10	6.10E-08	/	2.00E-01	=	3.05E-07
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.37E-06			Pathway total =		4.11E-03

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.8E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-03
Arsenic	Sum of all pathways	=	4.71E-05	100%	Sum of all pathways	=	1.1E-01
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-03
Beryllium	Sum of all pathways	=	5.26E-12		Sum of all pathways	=	5.0E-04
Cadmium	Sum of all pathways	=	7.82E-11		Sum of all pathways	=	2.1E-02
Chromium	Sum of all pathways	=	1.18E-08		Sum of all pathways	=	2.1E-02
Cobalt	Sum of all pathways	=	1.18E-09		Sum of all pathways	=	2.0E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	5.0E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-10
Nickel	Sum of all pathways	=	3.58E-11		Sum of all pathways	=	3.1E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-05
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-04
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	8.0E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	7.9E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	7.3E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	4.1E-08
Butylbenzylphthalate	Sum of all pathways	=	1.17E-09		Sum of all pathways	=	3.4E-06
2-Hexanone	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-06
Methylene chloride	Sum of all pathways	=	1.46E-11		Sum of all pathways	=	1.3E-06
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	**5E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	7.47E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Adult
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	4.32E-02	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.52E-06	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	3.66E-05	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	5.06E-04	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.23E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	3.35E-05	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	5.22E-05	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	4.56E-05	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	6.90E-05	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	1.06E-05	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	1.21E-01	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	4.83E-05	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.90E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	1.08E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	1.32E-05	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	5.12E-05	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	4.45E-05	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.14E-05	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	1.04E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	2.59E-04	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	3.23E-06	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	2.71E-04	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	2.37E-04	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	3.23E-08	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Benzene	1.71E-09	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	1.97E-09	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	3.86E-09	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	4.73E-02	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	1.66E-06	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	4.00E-05	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	5.54E-04	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.34E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	3.67E-05	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	5.71E-05	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	4.99E-05	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	7.54E-05	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.15E-05	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	1.32E-01	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	5.28E-05	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	2.08E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	1.18E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	1.45E-05	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	5.60E-05	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	4.86E-05	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.25E-05	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	1.14E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	2.83E-04	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	3.53E-06	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	2.97E-04	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	2.59E-04	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	3.53E-08	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Benzene	1.87E-09	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	2.15E-09	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	4.22E-09	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.04E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.64E-09	=	[	4.0E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	8.77E-08	=	[	9.6E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.21E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.94E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	8.04E-08	=	[	8.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.25E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.09E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.65E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.53E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	2.89E-04	=	[	3.2E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.16E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.56E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.58E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	3.17E-08	=	[	3.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.23E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.07E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	2.74E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	2.50E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	6.21E-07	=	[	6.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	7.73E-09	=	[	8.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	6.50E-07	=	[	7.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.67E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	7.74E-11	=	[	8.5E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Benzene	4.11E-12	=	[	4.5E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	4.72E-12	=	[	5.2E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	9.24E-12	=	[	1.0E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.13E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.99E-09	=	[	4.0E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	9.59E-08	=	[	9.6E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.33E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	8.79E-08	=	[	8.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.37E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.20E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.81E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.77E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.16E-04	=	[	3.2E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.27E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	3.47E-08	=	[	3.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.34E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.17E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	3.00E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	6.79E-07	=	[	6.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	8.46E-09	=	[	8.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	7.11E-07	=	[	7.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.21E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	8.47E-11	=	[	8.5E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Benzene	4.49E-12	=	[	4.5E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	5.16E-12	=	[	5.2E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	1.01E-11	=	[	1.0E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Adult
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.09E-06	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.20E-06	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Adult Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	4.32E-02	x	0.00E+00	=	0.00E+00	4.73E-02	/	1.00E+00	=	4.73E-02
Antimony	1.52E-06	x	0.00E+00	=	0.00E+00	1.66E-06	/	4.00E-04	=	4.16E-03
Arsenic	3.66E-05	x	1.50E+00	=	5.49E-05	4.00E-05	/	3.00E-04	=	1.33E-01
Barium	5.06E-04	x	0.00E+00	=	0.00E+00	5.54E-04	/	2.00E-01	=	2.77E-03
Beryllium	1.23E-06	x	0.00E+00	=	0.00E+00	1.34E-06	/	2.00E-03	=	6.71E-04
Boron	3.35E-05	x	0.00E+00	=	0.00E+00	3.67E-05	/	2.00E-01	=	1.83E-04
Chromium	5.22E-05	x	0.00E+00	=	0.00E+00	5.71E-05	/	3.00E-03	=	1.90E-02
Cobalt	4.56E-05	x	0.00E+00	=	0.00E+00	4.99E-05	/	3.00E-04	=	1.66E-01
Copper	6.90E-05	x	0.00E+00	=	0.00E+00	7.54E-05	/	4.00E-02	=	1.89E-03
Fluoride	1.06E-05	x	0.00E+00	=	0.00E+00	1.15E-05	/	4.00E-02	=	2.89E-04
Iron	1.21E-01	x	0.00E+00	=	0.00E+00	1.32E-01	/	7.00E-01	=	1.89E-01
Lithium	4.83E-05	x	0.00E+00	=	0.00E+00	5.28E-05	/	2.00E-03	=	2.64E-02
Manganese	1.90E-03	x	0.00E+00	=	0.00E+00	2.08E-03	/	1.40E-01	=	1.49E-02
Mercury	1.08E-07	x	0.00E+00	=	0.00E+00	1.18E-07	/	0.00E+00	=	NA
Molybdenum	1.32E-05	x	0.00E+00	=	0.00E+00	1.45E-05	/	5.00E-03	=	2.89E-03
Nickel	5.12E-05	x	0.00E+00	=	0.00E+00	5.60E-05	/	2.00E-02	=	2.80E-03
Nitrate	4.45E-05	x	0.00E+00	=	0.00E+00	4.86E-05	/	7.10E+00	=	6.85E-06
Nitrite	1.14E-05	x	0.00E+00	=	0.00E+00	1.25E-05	/	3.00E-01	=	4.17E-05
Selenium	1.04E-05	x	0.00E+00	=	0.00E+00	1.14E-05	/	5.00E-03	=	2.29E-03
Strontium	2.59E-04	x	0.00E+00	=	0.00E+00	2.83E-04	/	6.00E-01	=	4.72E-04
Total Uranium	3.23E-06	x	0.00E+00	=	0.00E+00	3.53E-06	/	3.00E-03	=	1.18E-03
Vanadium	2.71E-04	x	0.00E+00	=	0.00E+00	2.97E-04	/	5.00E-03	=	5.93E-02
Zinc	2.37E-04	x	0.00E+00	=	0.00E+00	2.59E-04	/	3.00E-01	=	8.63E-04
Acetone	3.23E-08	x	0.00E+00	=	0.00E+00	3.53E-08	/	9.00E-01	=	3.92E-08
Benzene	1.71E-09	x	5.50E-02	=	9.42E-11	1.87E-09	/	4.00E-03	=	4.69E-07
Styrene	1.97E-09	x	0.00E+00	=	0.00E+00	2.15E-09	/	2.00E-01	=	1.08E-08
Toluene	3.86E-09	x	0.00E+00	=	0.00E+00	4.22E-09	/	8.00E-02	=	5.27E-08
			Pathway total	=	5.49E-05			Pathway total	=	6.76E-01

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	1.04E-04	x		=	NA	1.13E-04	/[	5.00E-03	x	1000	]=	2.27E-05
Antimony	3.64E-09	x		=	NA	3.99E-09	/[		x	1000	]=	NA
Arsenic	8.77E-08	x	4.30E-03	=	3.77E-10	9.59E-08	/[	1.50E-05	x	1000	]=	6.39E-06
Barium	1.21E-06	x		=	NA	1.33E-06	/[	5.00E-04	x	1000	]=	2.65E-06
Beryllium	2.94E-09	x	2.40E-03	=	7.06E-12	3.22E-09	/[	2.00E-05	x	1000	]=	1.61E-07
Boron	8.04E-08	x	0.00E+00	=	0.00E+00	8.79E-08	/[	2.00E-02	x	1000	]=	4.40E-09
Chromium	1.25E-07	x	8.40E-02	=	1.05E-08	1.37E-07	/[	1.00E-04	x	1000	]=	1.37E-06
Cobalt	1.09E-07	x	9.00E-03	=	9.84E-10	1.20E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	1.65E-07	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	2.53E-08	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	2.89E-04	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	1.16E-07	x		=	NA	1.27E-07	/[		x	1000	]=	NA
Manganese	4.56E-06	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.97E-05
Mercury	2.58E-10	x	0.00E+00	=	0.00E+00	2.82E-10	/[	3.00E-04	x	1000	]=	9.41E-10
Molybdenum	3.17E-08	x	0.00E+00	=	0.00E+00	3.47E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.23E-07	x	2.60E-04	=	3.19E-11	1.34E-07	/[	9.00E-05	x	1000	]=	1.49E-06
Nitrate	1.07E-07	x		=	NA	1.17E-07	/[		x	1000	]=	NA
Nitrite	2.74E-08	x		=	NA	3.00E-08	/[		x	1000	]=	NA
Selenium	2.50E-08	x	0.00E+00	=	0.00E+00	2.74E-08	/[	2.00E-02	x	1000	]=	1.37E-09
Strontium	6.21E-07	x		=	NA	6.79E-07	/[		x	1000	]=	NA
Total Uranium	7.73E-09	x		=	NA	8.46E-09	/[	4.00E-05	x	1000	]=	2.11E-07
Vanadium	6.50E-07	x		=	NA	7.11E-07	/[	1.00E-04	x	1000	]=	7.11E-06
Zinc	5.67E-07	x		=	NA	6.21E-07	/[		x	1000	]=	NA
Acetone	7.74E-11	x	0.00E+00	=	0.00E+00	8.47E-11	/[	3.10E+01	x	1000	]=	2.73E-15
Benzene	4.11E-12	x	7.80E-06	=	3.20E-17	4.49E-12	/[	3.00E-02	x	1000	]=	1.50E-13
Styrene	4.72E-12	x	0.00E+00	=	0.00E+00	5.16E-12	/[	1.00E+00	x	1000	]=	5.16E-15
Toluene	9.24E-12	x	0.00E+00	=	0.00E+00	1.01E-11	/[	5.00E+00	x	1000	]=	2.02E-15
			Pathway total =		1.19E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.09E-06	x	1.50E+00	=	1.64E-06	1.20E-06	/	3.00E-04	=	3.99E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		2E-06			Pathway total =		3.99E-03

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	4.7E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-03
Arsenic	Sum of all pathways	=	5.65E-05	100%	Sum of all pathways	=	1.4E-01
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	2.8E-03
Beryllium	Sum of all pathways	=	7.06E-12		Sum of all pathways	=	6.7E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04
Chromium	Sum of all pathways	=	1.05E-08		Sum of all pathways	=	1.9E-02
Cobalt	Sum of all pathways	=	9.84E-10		Sum of all pathways	=	1.7E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	9.4E-10
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-03
Nickel	Sum of all pathways	=	3.19E-11		Sum of all pathways	=	2.8E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	6.8E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-03
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	4.7E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	5.9E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	8.6E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	3.9E-08
Benzene	Sum of all pathways	=	9.42E-11		Sum of all pathways	=	4.7E-07
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-08
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	5.3E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	**6E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	6.80E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for CTUIR Resident Adult

Exposure Pathways	Exposure Areas									
	A plus B	**C**	**E**	**F plus G**	**H plus I**	**J**	**L1 plus L2**	**P**	**R**	**U**
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	3E-05	2E-04	4E-05	3E-05	4E-05	6E-05	3E-05	4E-05	5E-05	5E-05
Inhalation	1E-08	2E-08	2E-08	1E-08	2E-08	1E-08	1E-08	1E-08	1E-08	1E-08
Dermal Contact	9E-07	5E-06	1E-06	9E-07	1E-06	2E-06	9E-07	1E-06	1E-06	2E-06
ELCR	**3E-05**	**2E-04**	**1E-04**	**3E-05**	**4E-05**	**6E-05**	**3E-05**	**4E-05**	**5E-05**	**6E-05**
Risk Conributors	Arsenic									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	0.6	1.1	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.7
Inhalation	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04
Dermal Contact	2E-03	1E-02	4E-03	2E-03	3E-03	5E-03	2E-03	3E-03	4E-03	4E-03
HI	0.6	**1.1**	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.7
Hazard Contributors	None	Aluminum, Arsenic, Chromium, Cobalt, Iron, Lithium, Manganese, Vanadium	None							

Appendix C

Attachment C-11: Results of Nonradiological Risk Assessment under CTUIR Residential Child Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.73E-02	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	6.07E-07	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	8.57E-06	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	1.94E-04	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	2.21E-07	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.18E-05	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.08E-05	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	2.92E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	5.09E-06	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.50E-02	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.90E-05	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.09E-04	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.48E-05	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	2.07E-05	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	2.12E-06	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.10E-07	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	8.63E-05	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Tin	2.65E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.32E-06	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.37E-04	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.04E-04	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Diethylphthalate	7.77E-07	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1254	1.72E-08	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.01E-01	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	7.08E-06	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.00E-04	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.27E-03	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	2.58E-06	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	2.54E-04	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.43E-04	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.40E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	5.93E-05	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.42E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.22E-04	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	9.44E-03	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	2.89E-04	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	2.42E-04	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	2.47E-05	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	1.29E-06	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	1.01E-03	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Tin	3.09E-04	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.54E-05	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.60E-03	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.22E-03	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Diethylphthalate	9.07E-06	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1254	2.01E-07	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.86E-06	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.12E-10	=	[	3.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.40E-09	=	[	5.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.98E-08	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.14E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.12E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.07E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.50E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.61E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.83E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.78E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.16E-07	=	[	4.8E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.27E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.06E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.09E-09	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	5.67E-11	=	[	6.6E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.43E-08	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.36E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.78E-10	=	[	7.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.04E-08	=	[	8.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.35E-08	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Diethylphthalate	3.99E-10	=	[	4.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1254	8.85E-12	=	[	1.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.03E-04	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.63E-09	=	[	3.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	5.14E-08	=	[	5.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.16E-06	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.33E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.31E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.25E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.05E-08	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.14E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.85E-06	=	[	4.8E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.49E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.27E-08	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	6.61E-10	=	[	6.6E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	5.17E-07	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.91E-09	=	[	7.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.22E-07	=	[	8.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.25E-07	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Diethylphthalate	4.66E-09	=	[	4.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1254	1.03E-10	=	[	1.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	3.60E-07	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.10E-10	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Diethylphthalate	1.09E-07	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1254	3.38E-09	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	4.20E-06	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.61E-09	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Diethylphthalate	1.27E-06	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1254	3.94E-08	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.73E-02	x	0.00E+00	=	0.00E+00	2.01E-01	/	1.00E+00	=	2.01E-01
Antimony	6.07E-07	x	0.00E+00	=	0.00E+00	7.08E-06	/	4.00E-04	=	1.77E-02
Arsenic	8.57E-06	x	1.50E+00	=	1.29E-05	1.00E-04	/	3.00E-04	=	3.33E-01
Barium	1.94E-04	x	0.00E+00	=	0.00E+00	2.27E-03	/	2.00E-01	=	1.13E-02
Cadmium	2.21E-07	x	0.00E+00	=	0.00E+00	2.58E-06	/	1.00E-03	=	2.58E-03
Chromium	2.18E-05	x	0.00E+00	=	0.00E+00	2.54E-04	/	3.00E-03	=	8.48E-02
Cobalt	2.08E-05	x	0.00E+00	=	0.00E+00	2.43E-04	/	3.00E-04	=	8.08E-01
Copper	2.92E-05	x	0.00E+00	=	0.00E+00	3.40E-04	/	4.00E-02	=	8.50E-03
Fluoride	5.09E-06	x	0.00E+00	=	0.00E+00	5.93E-05	/	4.00E-02	=	1.48E-03
Iron	5.50E-02	x	0.00E+00	=	0.00E+00	6.42E-01	/	7.00E-01	=	9.17E-01
Lithium	1.90E-05	x	0.00E+00	=	0.00E+00	2.22E-04	/	2.00E-03	=	1.11E-01
Manganese	8.09E-04	x	0.00E+00	=	0.00E+00	9.44E-03	/	1.40E-01	=	6.74E-02
Nickel	2.48E-05	x	0.00E+00	=	0.00E+00	2.89E-04	/	2.00E-02	=	1.45E-02
Nitrate	2.07E-05	x	0.00E+00	=	0.00E+00	2.42E-04	/	7.10E+00	=	3.40E-05
Nitrite	2.12E-06	x	0.00E+00	=	0.00E+00	2.47E-05	/	3.00E-01	=	8.23E-05
Silver	1.10E-07	x	0.00E+00	=	0.00E+00	1.29E-06	/	5.00E-03	=	2.57E-04
Strontium	8.63E-05	x	0.00E+00	=	0.00E+00	1.01E-03	/	6.00E-01	=	1.68E-03
Tin	2.65E-05	x	0.00E+00	=	0.00E+00	3.09E-04	/	6.00E-01	=	5.16E-04
Total Uranium	1.32E-06	x	0.00E+00	=	0.00E+00	1.54E-05	/	3.00E-03	=	5.13E-03
Vanadium	1.37E-04	x	0.00E+00	=	0.00E+00	1.60E-03	/	5.00E-03	=	3.20E-01
Zinc	1.04E-04	x	0.00E+00	=	0.00E+00	1.22E-03	/	3.00E-01	=	4.05E-03
Diethylphthalate	7.77E-07	x	0.00E+00	=	0.00E+00	9.07E-06	/	8.00E-01	=	1.13E-05
Aroclor-1254	1.72E-08	x	2.00E+00	=	3.45E-08	2.01E-07	/	2.00E-05	=	1.01E-02
			Pathway total	=	1.29E-05			Pathway total	=	2.92E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.86E-06	x		=	NA	1.03E-04	/[	5.00E-03	x	1000	]=	2.07E-05
Antimony	3.12E-10	x		=	NA	3.63E-09	/[		x	1000	]=	NA
Arsenic	4.40E-09	x	4.30E-03	=	1.89E-11	5.14E-08	/[	1.50E-05	x	1000	]=	3.43E-06
Barium	9.98E-08	x		=	NA	1.16E-06	/[	5.00E-04	x	1000	]=	2.33E-06
Cadmium	1.14E-10	x	1.80E-03	=	2.04E-13	1.33E-09	/[	1.00E-05	x	1000	]=	1.33E-07
Chromium	1.12E-08	x	8.40E-02	=	9.41E-10	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	1.07E-08	x	9.00E-03	=	9.61E-11	1.25E-07	/[	6.00E-06	x	1000	]=	2.08E-05
Copper	1.50E-08	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	2.61E-09	x		=	NA	3.05E-08	/[	1.30E-02	x	1000	]=	2.34E-09
Iron	2.83E-05	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	9.78E-09	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	4.16E-07	x		=	NA	4.85E-06	/[	5.00E-05	x	1000	]=	9.70E-05
Nickel	1.27E-08	x	2.60E-04	=	3.31E-12	1.49E-07	/[	9.00E-05	x	1000	]=	1.65E-06
Nitrate	1.06E-08	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Nitrite	1.09E-09	x		=	NA	1.27E-08	/[		x	1000	]=	NA
Silver	5.67E-11	x		=	NA	6.61E-10	/[		x	1000	]=	NA
Strontium	4.43E-08	x		=	NA	5.17E-07	/[		x	1000	]=	NA
Tin	1.36E-08	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Total Uranium	6.78E-10	x		=	NA	7.91E-09	/[	4.00E-05	x	1000	]=	1.98E-07
Vanadium	7.04E-08	x		=	NA	8.22E-07	/[	1.00E-04	x	1000	]=	8.22E-06
Zinc	5.35E-08	x		=	NA	6.25E-07	/[		x	1000	]=	NA
Diethylphthalate	3.99E-10	x		=	NA	4.66E-09	/[		x	1000	]=	NA
Aroclor-1254	8.85E-12	x	5.70E-04	=	5.05E-15	1.03E-10	/[		x	1000	]=	NA
			Pathway total =		1.06E-09					Pathway total =		1.56E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.60E-07	x	1.50E+00	=	5.40E-07	4.20E-06	/	3.00E-04	=	1.40E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	3.10E-10	x		=	NA	3.61E-09	/	2.50E-05	=	1.44E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	1.09E-07	x		=	NA	1.27E-06	/	8.00E-01	=	1.59E-06
Aroclor-1254	3.38E-09	x	2.00E+00	=	6.75E-09	3.94E-08	/	2.00E-05	=	1.97E-03
			Pathway total =		5.47E-07			Pathway total =		1.61E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**2.0E-01**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02	1%
Arsenic	Sum of all pathways	=	1.34E-05	Sum of all pathways	=	**3.5E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02	0%
Cadmium	Sum of all pathways	=	2.04E-13	Sum of all pathways	=	2.7E-03	0%
Chromium	Sum of all pathways	=	9.41E-10	Sum of all pathways	=	**8.5E-02**	3%
Cobalt	Sum of all pathways	=	9.61E-11	Sum of all pathways	=	**8.1E-01**	28%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	8.5E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**9.2E-01**	31%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.1E-01**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**6.8E-02**	2%
Nickel	Sum of all pathways	=	3.31E-12	Sum of all pathways	=	1.4E-02	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-05	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-03	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	5.2E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	5.1E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.2E-01**	11%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-03	0%
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-05	0%
Aroclor-1254	Sum of all pathways	=	4.12E-08	Sum of all pathways	=	1.2E-02	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	1E-05

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**2.94E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	2.17E-02	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	1.65E-06	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	4.85E-05	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	2.26E-04	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	9.21E-07	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.43E-07	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.93E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.51E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	4.14E-05	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	5.23E-06	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	6.54E-02	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	2.77E-05	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	1.03E-03	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	1.16E-08	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.97E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	3.98E-05	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	4.82E-06	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.83E-07	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	1.02E-04	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.93E-06	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.79E-04	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.17E-04	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.84E-07	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.54E-01	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	1.92E-05	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	5.65E-04	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.63E-03	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	1.07E-05	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	4.00E-06	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	3.41E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.93E-04	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	4.83E-04	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	6.11E-05	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	7.63E-01	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	3.23E-04	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.20E-02	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	1.35E-07	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.47E-04	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	4.64E-04	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	5.63E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	2.13E-06	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	1.19E-03	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	2.25E-05	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	2.09E-03	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.36E-03	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.15E-06	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.12E-05	=	[	1.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	8.47E-10	=	[	9.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	2.49E-08	=	[	2.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.16E-07	=	[	1.4E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	4.73E-10	=	[	5.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.76E-10	=	[	2.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.50E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.29E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	2.13E-08	=	[	2.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.69E-09	=	[	3.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.36E-05	=	[	3.9E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.42E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.27E-07	=	[	6.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	5.94E-12	=	[	6.9E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.53E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	2.04E-08	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.48E-09	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.39E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.25E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.93E-10	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	9.22E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	6.00E-08	=	[	7.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.48E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.30E-04	=	[	1.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	9.88E-09	=	[	9.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	2.90E-07	=	[	2.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.35E-06	=	[	1.4E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	5.52E-09	=	[	5.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	2.05E-09	=	[	2.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.75E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.48E-07	=	[	2.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.14E-08	=	[	3.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.92E-04	=	[	3.9E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.66E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	6.15E-06	=	[	6.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	6.93E-11	=	[	6.9E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	2.38E-07	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.10E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	6.12E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.16E-08	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	7.00E-07	=	[	7.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.11E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	2.04E-06	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	4.80E-10	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.58E-08	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	2.37E-05	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	5.60E-09	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	3.01E-07	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.17E-02	x	0.00E+00	=	0.00E+00	2.54E-01	/	1.00E+00	=	2.54E-01
Antimony	1.65E-06	x	0.00E+00	=	0.00E+00	1.92E-05	/	4.00E-04	=	4.81E-02
Arsenic	4.85E-05	x	1.50E+00	=	7.27E-05	5.65E-04	/	3.00E-04	=	1.88E+00
Barium	2.26E-04	x	0.00E+00	=	0.00E+00	2.63E-03	/	2.00E-01	=	1.32E-02
Beryllium	9.21E-07	x	0.00E+00	=	0.00E+00	1.07E-05	/	2.00E-03	=	5.37E-03
Cadmium	3.43E-07	x	0.00E+00	=	0.00E+00	4.00E-06	/	1.00E-03	=	4.00E-03
Chromium	2.93E-05	x	0.00E+00	=	0.00E+00	3.41E-04	/	3.00E-03	=	1.14E-01
Cobalt	2.51E-05	x	0.00E+00	=	0.00E+00	2.93E-04	/	3.00E-04	=	9.78E-01
Copper	4.14E-05	x	0.00E+00	=	0.00E+00	4.83E-04	/	4.00E-02	=	1.21E-02
Fluoride	5.23E-06	x	0.00E+00	=	0.00E+00	6.11E-05	/	4.00E-02	=	1.53E-03
Iron	6.54E-02	x	0.00E+00	=	0.00E+00	7.63E-01	/	7.00E-01	=	1.09E+00
Lithium	2.77E-05	x	0.00E+00	=	0.00E+00	3.23E-04	/	2.00E-03	=	1.61E-01
Manganese	1.03E-03	x	0.00E+00	=	0.00E+00	1.20E-02	/	1.40E-01	=	8.55E-02
Mercury	1.16E-08	x	0.00E+00	=	0.00E+00	1.35E-07	/	0.00E+00	=	NA
Nickel	2.97E-05	x	0.00E+00	=	0.00E+00	3.47E-04	/	2.00E-02	=	1.73E-02
Nitrate	3.98E-05	x	0.00E+00	=	0.00E+00	4.64E-04	/	7.10E+00	=	6.54E-05
Nitrite	4.82E-06	x	0.00E+00	=	0.00E+00	5.63E-05	/	3.00E-01	=	1.88E-04
Silver	1.83E-07	x	0.00E+00	=	0.00E+00	2.13E-06	/	5.00E-03	=	4.27E-04
Strontium	1.02E-04	x	0.00E+00	=	0.00E+00	1.19E-03	/	6.00E-01	=	1.99E-03
Total Uranium	1.93E-06	x	0.00E+00	=	0.00E+00	2.25E-05	/	3.00E-03	=	7.51E-03
Vanadium	1.79E-04	x	0.00E+00	=	0.00E+00	2.09E-03	/	5.00E-03	=	4.19E-01
Zinc	1.17E-04	x	0.00E+00			1.36E-03	/	3.00E-01	=	4.54E-03
Butylbenzylphthalate	1.84E-07	x	1.90E-03	=	3.50E-10	2.15E-06	/	2.00E-01	=	1.08E-05
			Pathway total	=	7.27E-05			Pathway total	=	5.10E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.12E-05	x		=	NA	1.30E-04	/[	5.00E-03	x	1000	]=	2.61E-05
Antimony	8.47E-10	x		=	NA	9.88E-09	/[		x	1000	]=	NA
Arsenic	2.49E-08	x	4.30E-03	=	1.07E-10	2.90E-07	/[	1.50E-05	x	1000	]=	1.94E-05
Barium	1.16E-07	x		=	NA	1.35E-06	/[	5.00E-04	x	1000	]=	2.71E-06
Beryllium	4.73E-10	x	2.40E-03	=	1.14E-12	5.52E-09	/[	2.00E-05	x	1000	]=	2.76E-07
Cadmium	1.76E-10	x	1.80E-03	=	3.17E-13	2.05E-09	/[	1.00E-05	x	1000	]=	2.05E-07
Chromium	1.50E-08	x	8.40E-02	=	1.26E-09	1.75E-07	/[	1.00E-04	x	1000	]=	1.75E-06
Cobalt	1.29E-08	x	9.00E-03	=	1.16E-10	1.51E-07	/[	6.00E-06	x	1000	]=	2.51E-05
Copper	2.13E-08	x		=	NA	2.48E-07	/[		x	1000	]=	NA
Fluoride	2.69E-09	x		=	NA	3.14E-08	/[	1.30E-02	x	1000	]=	2.41E-09
Iron	3.36E-05	x		=	NA	3.92E-04	/[		x	1000	]=	NA
Lithium	1.42E-08	x		=	NA	1.66E-07	/[		x	1000	]=	NA
Manganese	5.27E-07	x		=	NA	6.15E-06	/[	5.00E-05	x	1000	]=	1.23E-04
Mercury	5.94E-12	x	0.00E+00	=	0.00E+00	6.93E-11	/[	3.00E-04	x	1000	]=	2.31E-10
Nickel	1.53E-08	x	2.60E-04	=	3.97E-12	1.78E-07	/[	9.00E-05	x	1000	]=	1.98E-06
Nitrate	2.04E-08	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Nitrite	2.48E-09	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Silver	9.39E-11	x		=	NA	1.10E-09	/[		x	1000	]=	NA
Strontium	5.25E-08	x		=	NA	6.12E-07	/[		x	1000	]=	NA
Total Uranium	9.93E-10	x		=	NA	1.16E-08	/[	4.00E-05	x	1000	]=	2.90E-07
Vanadium	9.22E-08	x		=	NA	1.08E-06	/[	1.00E-04	x	1000	]=	1.08E-05
Zinc	6.00E-08	x				7.00E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	9.48E-11	x	0.00E+00	=	0.00E+00	1.11E-09	/		x	1000	]=	NA
			Pathway total =		1.49E-09					Pathway total =		2.12E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.04E-06	x	1.50E+00	=	3.05E-06	2.37E-05	/	3.00E-04	=	7.91E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.80E-10	x		=	NA	5.60E-09	/	2.50E-05	=	2.24E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	2.58E-08	x	1.90E-03	=	4.91E-11	3.01E-07	/	2.00E-01	=	1.51E-06
			Pathway total =		3.05E-06			Pathway total =		7.94E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Co	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.5E-01**	5%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	4.8E-02	1%
Arsenic	Sum of all pathways	=	**8E-05**	100%	Sum of all pathways	=	**2.0E+00**	38%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02	0%
Beryllium	Sum of all pathways	=	1.14E-12	0%	Sum of all pathways	=	5.4E-03	0%
Cadmium	Sum of all pathways	=	3.17E-13	0%	Sum of all pathways	=	4.2E-03	0%
Chromium	Sum of all pathways	=	1.26E-09	0%	Sum of all pathways	=	**1.1E-01**	2%
Cobalt	Sum of all pathways	=	1.16E-10	0%	Sum of all pathways	=	**9.8E-01**	19%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**1.1E+00**	21%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.6E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**8.6E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-10	0%
Nickel	Sum of all pathways	=	3.97E-12	0%	Sum of all pathways	=	1.7E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	6.5E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	7.5E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**4.2E-01**	8%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	4.00E-10	0%	Sum of all pathways	=	1.2E-05	1%

Total Carcinogenic Risk All Pathways and Chemicals	=	**8E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**5.18E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.70E-02	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	4.07E-07	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.19E-05	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	1.79E-04	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	3.63E-07	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Boron	7.63E-06	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	7.45E-06	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	3.93E-05	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.02E-05	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	3.77E-05	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	3.38E-06	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.53E-02	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	2.09E-05	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	1.13E-03	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	5.30E-08	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.83E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	1.15E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	3.20E-06	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	1.28E-06	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.94E-07	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	7.93E-05	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.89E-06	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.34E-04	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.02E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	1.52E-08	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.83E-07	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	7.70E-10	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Aldrin	4.57E-09	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.98E-01	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	4.75E-06	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.39E-04	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.09E-03	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	4.24E-06	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Boron	8.91E-05	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	8.69E-05	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	4.59E-04	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.35E-04	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	4.40E-04	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	3.95E-05	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.45E-01	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.43E-04	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.32E-02	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	6.19E-07	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.31E-04	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	1.34E-04	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	3.73E-05	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	1.49E-05	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	2.27E-06	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	9.25E-04	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	2.21E-05	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.57E-03	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.19E-03	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	1.77E-07	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	3.31E-06	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	8.99E-09	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Aldrin	5.33E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.71E-06	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.09E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	6.11E-09	=	[	7.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.21E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.87E-10	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	3.92E-09	=	[	4.6E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	3.83E-09	=	[	4.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	2.02E-08	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.04E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.94E-08	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.74E-09	=	[	2.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.84E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.07E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.81E-07	=	[	6.8E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.72E-11	=	[	3.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.46E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	5.89E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.64E-09	=	[	1.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	6.58E-10	=	[	7.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.98E-11	=	[	1.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.07E-08	=	[	4.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.71E-10	=	[	1.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.90E-08	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.26E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.78E-12	=	[	9.1E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.46E-10	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.96E-13	=	[	4.6E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aldrin	2.35E-12	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.02E-04	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.44E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	7.12E-08	=	[	7.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.18E-09	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	4.58E-08	=	[	4.6E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.47E-08	=	[	4.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.36E-07	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.21E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.26E-07	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.03E-08	=	[	2.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.32E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	6.78E-06	=	[	6.8E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	3.18E-10	=	[	3.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.92E-08	=	[	1.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	7.67E-09	=	[	7.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.16E-09	=	[	1.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.75E-07	=	[	4.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.13E-08	=	[	1.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.05E-07	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.14E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	9.08E-11	=	[	9.1E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.70E-09	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	4.62E-12	=	[	4.6E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aldrin	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	4.99E-07	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	1.04E-08	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	3.97E-08	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Aldrin	6.40E-10	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	5.82E-06	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	1.22E-07	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	4.63E-07	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Aldrin	7.47E-09	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.70E-02	x	0.00E+00	=	0.00E+00	1.98E-01	/	1.00E+00	=	1.98E-01
Antimony	4.07E-07	x	0.00E+00	=	0.00E+00	4.75E-06	/	4.00E-04	=	1.19E-02
Arsenic	1.19E-05	x	1.50E+00	=	1.78E-05	1.39E-04	/	3.00E-04	=	4.62E-01
Barium	1.79E-04	x	0.00E+00	=	0.00E+00	2.09E-03	/	2.00E-01	=	1.05E-02
Beryllium	3.63E-07	x	0.00E+00	=	0.00E+00	4.24E-06	/	2.00E-03	=	2.12E-03
Boron	7.63E-06	x	0.00E+00	=	0.00E+00	8.91E-05	/	2.00E-01	=	4.45E-04
Cadmium	7.45E-06	x	0.00E+00	=	0.00E+00	8.69E-05	/	1.00E-03	=	8.69E-02
Chromium	3.93E-05	x	0.00E+00	=	0.00E+00	4.59E-04	/	3.00E-03	=	1.53E-01
Cobalt	2.02E-05	x	0.00E+00	=	0.00E+00	2.35E-04	/	3.00E-04	=	7.84E-01
Copper	3.77E-05	x	0.00E+00	=	0.00E+00	4.40E-04	/	4.00E-02	=	1.10E-02
Fluoride	3.38E-06	x	0.00E+00	=	0.00E+00	3.95E-05	/	4.00E-02	=	9.87E-04
Iron	5.53E-02	x	0.00E+00	=	0.00E+00	6.45E-01	/	7.00E-01	=	9.22E-01
Lithium	2.09E-05	x	0.00E+00	=	0.00E+00	2.43E-04	/	2.00E-03	=	1.22E-01
Manganese	1.13E-03	x	0.00E+00	=	0.00E+00	1.32E-02	/	1.40E-01	=	9.43E-02
Mercury	5.30E-08	x	0.00E+00	=	0.00E+00	6.19E-07	/	0.00E+00	=	NA
Nickel	2.83E-05	x	0.00E+00	=	0.00E+00	3.31E-04	/	2.00E-02	=	1.65E-02
Nitrate	1.15E-05	x	0.00E+00	=	0.00E+00	1.34E-04	/	7.10E+00	=	1.89E-05
Nitrite	3.20E-06	x	0.00E+00	=	0.00E+00	3.73E-05	/	3.00E-01	=	1.24E-04
Selenium	1.28E-06	x	0.00E+00	=	0.00E+00	1.49E-05	/	5.00E-03	=	2.99E-03
Silver	1.94E-07	x	0.00E+00	=	0.00E+00	2.27E-06	/	5.00E-03	=	4.53E-04
Strontium	7.93E-05	x	0.00E+00	=	0.00E+00	9.25E-04	/	6.00E-01	=	1.54E-03
Total Uranium	1.89E-06	x	0.00E+00	=	0.00E+00	2.21E-05	/	3.00E-03	=	7.35E-03
Vanadium	1.34E-04	x	0.00E+00	=	0.00E+00	1.57E-03	/	5.00E-03	=	3.14E-01
Zinc	1.02E-04	x	0.00E+00	=	0.00E+00	1.19E-03	/	3.00E-01	=	3.98E-03
Acetone	1.52E-08	x	0.00E+00	=	0.00E+00	1.77E-07	/	9.00E-01	=	1.96E-07
Butylbenzylphthalate	2.83E-07	x	1.90E-03	=	5.39E-10	3.31E-06	/	2.00E-01	=	1.65E-05
Toluene	7.70E-10	x	0.00E+00	=	0.00E+00	8.99E-09	/	8.00E-02	=	1.12E-07
Aldrin	4.57E-09	x	1.70E+01	=	7.77E-08	5.33E-08	/	3.00E-05	=	1.78E-03
			Pathway total	=	1.79E-05			Pathway total	=	3.21E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.71E-06	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	2.09E-10	x		=	NA	2.44E-09	/[		x	1000	]=	NA
Arsenic	6.11E-09	x	4.30E-03	=	2.63E-11	7.12E-08	/[	1.50E-05	x	1000	]=	4.75E-06
Barium	9.21E-08	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.15E-06
Beryllium	1.87E-10	x	2.40E-03	=	4.48E-13	2.18E-09	/[	2.00E-05	x	1000	]=	1.09E-07
Boron	3.92E-09	x	0.00E+00	=	0.00E+00	4.58E-08	/[	2.00E-02	x	1000	]=	2.29E-09
Cadmium	3.83E-09	x	1.80E-03	=	6.89E-12	4.47E-08	/[	1.00E-05	x	1001	]=	4.46E-06
Chromium	2.02E-08	x	8.40E-02	=	1.70E-09	2.36E-07	/[	1.00E-04	x	1002	]=	2.35E-06
Cobalt	1.04E-08	x	9.00E-03	=	9.32E-11	1.21E-07	/[	6.00E-06	x	1003	]=	2.01E-05
Copper	1.94E-08	x		=	NA	2.26E-07	/[		x	1004	]=	NA
Fluoride	1.74E-09	x		=	NA	2.03E-08	/[	1.30E-02	x	1005	]=	1.55E-09
Iron	2.84E-05	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	1.07E-08	x		=	NA	1.25E-07	/[		x	1000	]=	NA
Manganese	5.81E-07	x		=	NA	6.78E-06	/[	5.00E-05	x	1000	]=	1.36E-04
Mercury	2.72E-11	x	0.00E+00	=	0.00E+00	3.18E-10	/[	3.00E-04	x	1000	]=	1.06E-09
Nickel	1.46E-08	x	2.60E-04	=	3.79E-12	1.70E-07	/[	9.00E-05	x	1000	]=	1.89E-06
Nitrate	5.89E-09	x		=	NA	6.88E-08	/[		x	1000	]=	NA
Nitrite	1.64E-09	x		=	NA	1.92E-08	/[		x	1000	]=	NA
Selenium	6.58E-10	x	0.00E+00	=	0.00E+00	7.67E-09	/[	2.00E-02	x	1000	]=	3.84E-10
Silver	9.98E-11	x		=	NA	1.16E-09	/[		x	1000	]=	NA
Strontium	4.07E-08	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Total Uranium	9.71E-10	x		=	NA	1.13E-08	/[	4.00E-05	x	1000	]=	2.83E-07
Vanadium	6.90E-08	x		=	NA	8.05E-07	/[	1.00E-04	x	1000	]=	8.05E-06
Zinc	5.26E-08	x		=	NA	6.14E-07	/[		x	1000	]=	NA
Acetone	7.78E-12	x	0.00E+00	=	0.00E+00	9.08E-11	/[	3.10E+01	x	1000	]=	2.93E-15
Butylbenzylphthalate	1.46E-10	x	0.00E+00	=	0.00E+00	1.70E-09	/[		x	1000	]=	NA
Toluene	3.96E-13	x	0.00E+00	=	0.00E+00	4.62E-12	/[	5.00E+00	x	1000	]=	9.23E-16
Aldrin	2.35E-12	x	4.90E-03	=	1.15E-14	2.74E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.83E-09					Pathway total =		2.00E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.99E-07	x	1.50E+00	=	7.49E-07	5.82E-06	/	3.00E-04	=	1.94E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.04E-08	x		=	NA	1.22E-07	/	2.50E-05	=	4.87E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.97E-08	x	1.90E-03	=	7.54E-11	4.63E-07	/	2.00E-01	=	2.31E-06
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	6.40E-10	x	1.70E+01	=	1.09E-08	7.47E-09	/	3.00E-05	=	2.49E-04
			Pathway total =		7.60E-07			Pathway total =		2.45E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.0E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02	0%
Arsenic	Sum of all pathways	=	1.86E-05	100%	Sum of all pathways	=	**4.8E-01**	15%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	0%
Beryllium	Sum of all pathways	=	4.48E-13	0%	Sum of all pathways	=	2.1E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-04	0%
Cadmium	Sum of all pathways	=	6.89E-12	0%	Sum of all pathways	=	**9.2E-02**	3%
Chromium	Sum of all pathways	=	1.70E-09	0%	Sum of all pathways	=	**1.5E-01**	5%
Cobalt	Sum of all pathways	=	9.32E-11	0%	Sum of all pathways	=	**7.8E-01**	24%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	9.9E-04	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.2E-01**	29%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.2E-01**	4%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**9.4E-02**	3%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-09	0%
Nickel	Sum of all pathways	=	3.79E-12	0%	Sum of all pathways	=	1.7E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.1E-01**	10%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-07	0%
Butylbenzylphthalate	Sum of all pathways	=	6.14E-10	0%	Sum of all pathways	=	1.9E-05	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-07	0%
Aldrin	Sum of all pathways	=	8.86E-08	0%	Sum of all pathways	=	2.0E-03	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**2E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.23E+00

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.55E-02	=	[	6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	5.65E-07	=	[	2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	7.97E-06	=	[	3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	2.15E-04	=	[	9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	6.81E-07	=	[	2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	2.66E-07	=	[	1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.05E-05	=	[	8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	1.87E-05	=	[	8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	2.98E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	4.83E-06	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.47E-02	=	[	2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.70E-05	=	[	7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.83E-04	=	[	3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	6.95E-08	=	[	3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.57E-05	=	[	1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	1.64E-05	=	[	7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	6.99E-06	=	[	3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.87E-07	=	[	8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	8.27E-05	=	[	3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Tin	1.45E-05	=	[	6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.64E-06	=	[	7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.59E-04	=	[	6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	8.76E-05	=	[	3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
2-Butanone	5.68E-09	=	[	2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	9.22E-06	=	[	4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.35E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Hexane	8.21E-08	=	[	3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	4.57E-09	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
o-Xylene	2.93E-10	=	[	1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	1.49E-09	=	[	6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	2.24E-09	=	[	9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Xylenes (total)	1.06E-09	=	[	4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	5.77E-08	=	[	2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Gamma-BHC (Lindane)	1.17E-08	=	[	5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	4.71E-08	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.80E-01	=	[	6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	6.59E-06	=	[	2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	9.30E-05	=	[	3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.51E-03	=	[	9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	7.95E-06	=	[	2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.11E-06	=	[	1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	2.39E-04	=	[	8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.18E-04	=	[	8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.47E-04	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	5.63E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.39E-01	=	[	2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	1.98E-04	=	[	7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.03E-02	=	[	3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	8.11E-07	=	[	3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.00E-04	=	[	1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	1.91E-04	=	[	7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	8.16E-05	=	[	3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	2.18E-06	=	[	8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	9.65E-04	=	[	3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Tin	1.70E-04	=	[	6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.91E-05	=	[	7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.86E-03	=	[	6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.02E-03	=	[	3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
2-Butanone	6.63E-08	=	[	2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	1.08E-04	=	[	4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	1.58E-06	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Hexane	9.57E-07	=	[	3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	5.33E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
o-Xylene	3.41E-09	=	[	1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	1.74E-08	=	[	6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	2.61E-08	=	[	9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Xylenes (total)	1.23E-08	=	[	4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	6.73E-07	=	[	2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Gamma-BHC (Lindane)	1.36E-07	=	[	5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	5.49E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.94E-06	=	[	9.3E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.90E-10	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.10E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.10E-07	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.50E-10	=	[	4.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.37E-10	=	[	1.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.05E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.61E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.53E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.48E-09	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.81E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.72E-09	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.54E-07	=	[	5.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	3.57E-11	=	[	4.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.32E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	8.40E-09	=	[	9.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.59E-09	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.60E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.25E-08	=	[	5.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	7.47E-09	=	[	8.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	8.40E-10	=	[	9.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	8.19E-08	=	[	9.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.50E-08	=	[	5.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Butanone	2.92E-12	=	[	3.4E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	4.73E-09	=	[	5.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.95E-11	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	4.22E-11	=	[	4.9E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	2.35E-12	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
o-Xylene	1.50E-13	=	[	1.8E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	7.68E-13	=	[	9.0E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	1.15E-12	=	[	1.3E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.44E-13	=	[	6.3E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.96E-11	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	5.99E-12	=	[	7.0E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.42E-11	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.26E-05	=	[	9.3E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.39E-09	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.78E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.29E-06	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	4.08E-09	=	[	4.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.60E-09	=	[	1.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.23E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.12E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.28E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.02E-07	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.29E-06	=	[	5.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	4.16E-10	=	[	4.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.54E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	9.80E-08	=	[	9.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.19E-08	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.12E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.96E-07	=	[	5.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	8.71E-08	=	[	8.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.80E-09	=	[	9.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	9.55E-07	=	[	9.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.25E-07	=	[	5.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Butanone	3.40E-11	=	[	3.4E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	5.52E-08	=	[	5.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	4.92E-10	=	[	4.9E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
o-Xylene	1.75E-12	=	[	1.8E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	8.96E-12	=	[	9.0E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	1.34E-11	=	[	1.3E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Xylenes (total)	6.34E-12	=	[	6.3E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.46E-10	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Gamma-BHC (Lindane)	6.99E-11	=	[	7.0E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	3.35E-07	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.73E-10	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.29E-06	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.90E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	8.08E-09	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Gamma-BHC (Lindane)	6.53E-10	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	9.23E-09	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	3.91E-06	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	4.35E-09	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	1.51E-05	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.21E-07	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Xylenes (total)	NA	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	9.42E-08	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Gamma-BHC (Lindane)	7.62E-09	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	1.08E-07	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.55E-02	x	0.00E+00	=	0.00E+00	1.80E-01	/	1.00E+00	=	1.80E-01
Antimony	5.65E-07	x	0.00E+00	=	0.00E+00	6.59E-06	/	4.00E-04	=	1.65E-02
Arsenic	7.97E-06	x	1.50E+00	=	1.20E-05	9.30E-05	/	3.00E-04	=	3.10E-01
Barium	2.15E-04	x	0.00E+00	=	0.00E+00	2.51E-03	/	2.00E-01	=	1.25E-02
Beryllium	6.81E-07	x	0.00E+00	=	0.00E+00	7.95E-06	/	2.00E-03	=	3.97E-03
Cadmium	2.66E-07	x	0.00E+00	=	0.00E+00	3.11E-06	/	1.00E-03	=	3.11E-03
Chromium	2.05E-05	x	0.00E+00	=	0.00E+00	2.39E-04	/	3.00E-03	=	7.98E-02
Cobalt	1.87E-05	x	0.00E+00	=	0.00E+00	2.18E-04	/	3.00E-04	=	7.27E-01
Copper	2.98E-05	x	0.00E+00	=	0.00E+00	3.47E-04	/	4.00E-02	=	8.69E-03
Fluoride	4.83E-06	x	0.00E+00	=	0.00E+00	5.63E-05	/	4.00E-02	=	1.41E-03
Iron	5.47E-02	x	0.00E+00	=	0.00E+00	6.39E-01	/	7.00E-01	=	9.12E-01
Lithium	1.70E-05	x	0.00E+00	=	0.00E+00	1.98E-04	/	2.00E-03	=	9.90E-02
Manganese	8.83E-04	x	0.00E+00	=	0.00E+00	1.03E-02	/	1.40E-01	=	7.36E-02
Mercury	6.95E-08	x	0.00E+00	=	0.00E+00	8.11E-07	/	0.00E+00	=	NA
Nickel	2.57E-05	x	0.00E+00	=	0.00E+00	3.00E-04	/	2.00E-02	=	1.50E-02
Nitrate	1.64E-05	x	0.00E+00	=	0.00E+00	1.91E-04	/	7.10E+00	=	2.69E-05
Nitrite	6.99E-06	x	0.00E+00	=	0.00E+00	8.16E-05	/	3.00E-01	=	2.72E-04
Silver	1.87E-07	x	0.00E+00	=	0.00E+00	2.18E-06	/	5.00E-03	=	4.36E-04
Strontium	8.27E-05	x	0.00E+00	=	0.00E+00	9.65E-04	/	6.00E-01	=	1.61E-03
Tin	1.45E-05	x	0.00E+00	=	0.00E+00	1.70E-04	/	6.00E-01	=	2.83E-04
Total Uranium	1.64E-06	x	0.00E+00	=	0.00E+00	1.91E-05	/	3.00E-03	=	6.36E-03
Vanadium	1.59E-04	x	0.00E+00	=	0.00E+00	1.86E-03	/	5.00E-03	=	3.72E-01
Zinc	8.76E-05	x	0.00E+00	=	0.00E+00	1.02E-03	/	3.00E-01	=	3.41E-03
2-Butanone	5.68E-09	x	0.00E+00	=	0.00E+00	6.63E-08	/	6.00E-01	=	1.10E-07
Bis(2-ethylhexyl) phthalate	9.22E-06	x	1.40E-02	=	1.29E-07	1.08E-04	/	2.00E-02	=	5.38E-03
Butylbenzylphthalate	1.35E-07	x	1.90E-03	=	2.57E-10	1.58E-06	/	2.00E-01	=	7.90E-06
Hexane	8.21E-08	x	0.00E+00	=	0.00E+00	9.57E-07	/	6.00E-02	=	1.60E-05
Methylene chloride	4.57E-09	x	2.00E-03	=	9.14E-12	5.33E-08	/	6.00E-03	=	8.89E-06
o-Xylene	2.93E-10	x	0.00E+00	=	0.00E+00	3.41E-09	/	2.00E-01	=	1.71E-08
Styrene	1.49E-09	x	0.00E+00	=	0.00E+00	1.74E-08	/	2.00E-01	=	8.72E-08
Toluene	2.24E-09	x	0.00E+00	=	0.00E+00	2.61E-08	/	8.00E-02	=	3.26E-07
Xylenes (total)	1.06E-09	x	0.00E+00	=	0.00E+00	1.23E-08	/	2.00E-01	=	6.17E-08
beta-BHC	5.77E-08	x	1.80E+00	=	1.04E-07	6.73E-07	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	1.17E-08	x	1.10E+00	=	1.28E-08	1.36E-07	/	3.00E-04	=	4.53E-04
Aroclor-1260	4.71E-08	x	2.00E+00	=	9.42E-08	5.49E-07	/	0.00E+00	=	NA
			Pathway total	=	1.23E-05			Pathway total	=	2.83E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.94E-06	x		=	NA	9.26E-05	/[	5.00E-03	x	1000	]=	1.85E-05
Antimony	2.90E-10	x		=	NA	3.39E-09	/[		x	1000	]=	NA
Arsenic	4.10E-09	x	4.30E-03	=	1.76E-11	4.78E-08	/[	1.50E-05	x	1000	]=	3.19E-06
Barium	1.10E-07	x		=	NA	1.29E-06	/[	5.00E-04	x	1000	]=	2.58E-06
Beryllium	3.50E-10	x	2.40E-03	=	8.40E-13	4.08E-09	/[	2.00E-05	x	1000	]=	2.04E-07
Cadmium	1.37E-10	x	1.80E-03	=	2.46E-13	1.60E-09	/[	1.00E-05	x	1000	]=	1.60E-07
Chromium	1.05E-08	x	8.40E-02	=	8.85E-10	1.23E-07	/[	1.00E-04	x	1000	]=	1.23E-06
Cobalt	9.61E-09	x	9.00E-03	=	8.65E-11	1.12E-07	/[	6.00E-06	x	1000	]=	1.87E-05
Copper	1.53E-08	x		=	NA	1.78E-07	/[		x	1000	]=	NA
Fluoride	2.48E-09	x		=	NA	2.89E-08	/[	1.30E-02	x	1000	]=	2.23E-09
Iron	2.81E-05	x		=	NA	3.28E-04	/[		x	1000	]=	NA
Lithium	8.72E-09	x		=	NA	1.02E-07	/[		x	1000	]=	NA
Manganese	4.54E-07	x		=	NA	5.29E-06	/[	5.00E-05	x	1000	]=	1.06E-04
Mercury	3.57E-11	x	0.00E+00	=	0.00E+00	4.16E-10	/[	3.00E-04	x	1000	]=	1.39E-09
Nickel	1.32E-08	x	2.60E-04	=	3.44E-12	1.54E-07	/[	9.00E-05	x	1000	]=	1.71E-06
Nitrate	8.40E-09	x		=	NA	9.80E-08	/[		x	1000	]=	NA
Nitrite	3.59E-09	x		=	NA	4.19E-08	/[		x	1000	]=	NA
Silver	9.60E-11	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	4.25E-08	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	7.47E-09	x		=	NA	8.71E-08	/[		x	1000	]=	NA
Total Uranium	8.40E-10	x		=	NA	9.80E-09	/[	4.00E-05	x	1000	]=	2.45E-07
Vanadium	8.19E-08	x		=	NA	9.55E-07	/[	1.00E-04	x	1000	]=	9.55E-06
Zinc	4.50E-08	x		=	NA	5.25E-07	/[		x	1000	]=	NA
2-Butanone	2.92E-12	x	0.00E+00	=	0.00E+00	3.40E-11	/[	5.00E+00	x	1000	]=	6.81E-15
Bis(2-ethylhexyl) phthalate	4.73E-09	x	2.40E-06	=	1.14E-14	5.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.95E-11	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	4.22E-11	x	0.00E+00	=	0.00E+00	4.92E-10	/[	7.00E-01	x	1000	]=	7.03E-13
Methylene chloride	2.35E-12	x	1.00E-08	=	2.35E-20	2.74E-11	/[	6.00E-01	x	1000	]=	4.57E-14
o-Xylene	1.50E-13	x	0.00E+00	=	0.00E+00	1.75E-12	/[	1.00E-01	x	1000	]=	1.75E-14
Styrene	7.68E-13	x	0.00E+00	=	0.00E+00	8.96E-12	/[	1.00E+00	x	1000	]=	8.96E-15
Toluene	1.15E-12	x	0.00E+00	=	0.00E+00	1.34E-11	/[	5.00E+00	x	1000	]=	2.68E-15
Xylenes (total)	5.44E-13	x	0.00E+00	=	0.00E+00	6.34E-12	/[	1.00E-01	x	1000	]=	6.34E-14
beta-BHC	2.96E-11	x	5.30E-04	=	1.57E-14	3.46E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	5.99E-12	x	3.10E-04	=	1.86E-15	6.99E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.42E-11	x	5.70E-04	=	1.38E-14	2.82E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.94E-10					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.35E-07	x	1.50E+00	=	5.02E-07	3.91E-06	/	3.00E-04	=	1.3E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.0E+00
Cadmium	3.73E-10	x		=	NA	4.35E-09	/	2.50E-05	=	1.7E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.0E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	1.29E-06	x	1.40E-02	=	1.81E-08	1.51E-05	/	2.00E-02	=	7.53E-04
Butylbenzylphthalate	1.90E-08	x	1.90E-03	=	3.60E-11	2.21E-07	/	2.00E-01	=	1.11E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	NA	/	2.00E-01	=	NA
beta-BHC	8.08E-09	x	1.80E+00	=	1.45E-08	9.42E-08	/		=	NA
Gamma-BHC (Lindane)	6.53E-10	x	1.10E+00	=	7.18E-10	7.62E-09	/	3.00E-04	=	2.54E-05
Aroclor-1260	9.23E-09	x	2.00E+00	=	1.85E-08	1.08E-07	/		=	NA
			Pathway total =		5.54E-07			Pathway total =		1.40E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.8E-01**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-02	1%
Arsenic	Sum of all pathways	=	1.25E-05	Sum of all pathways	=	**3.2E-01**	11%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02	0%
Beryllium	Sum of all pathways	=	8.40E-13	Sum of all pathways	=	4.0E-03	0%
Cadmium	Sum of all pathways	=	2.46E-13	Sum of all pathways	=	3.3E-03	0%
Chromium	Sum of all pathways	=	8.85E-10	Sum of all pathways	=	**8.0E-02**	3%
Cobalt	Sum of all pathways	=	8.65E-11	Sum of all pathways	=	**7.3E-01**	26%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**9.1E-01**	32%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**9.9E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**7.4E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-09	0%
Nickel	Sum of all pathways	=	3.44E-12	Sum of all pathways	=	1.5E-02	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.4E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.4E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.7E-01**	13%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03	0%
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.47E-07	Sum of all pathways	=	6.1E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.93E-10	Sum of all pathways	=	9.0E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-05	0%
Methylene chloride	Sum of all pathways	=	9.14E-12	Sum of all pathways	=	8.9E-06	0%
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-08	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	8.7E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.3E-07	0%
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	6.2E-08	0%
beta-BHC	Sum of all pathways	=	1.18E-07	Sum of all pathways	=	**NA**	
Gamma-BHC (Lindane)	Sum of all pathways	=	1.35E-08	Sum of all pathways	=	4.8E-04	0%
Aroclor-1260	Sum of all pathways	=	1.13E-07	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.29E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**2.85E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.60E-02	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	5.85E-07	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.15E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	2.07E-04	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	4.54E-07	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.14E-07	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	3.84E-05	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.33E-05	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	2.79E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	3.79E-06	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.96E-02	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.73E-05	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	9.33E-04	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	4.57E-06	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.99E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	7.42E-05	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	2.97E-06	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	2.25E-06	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.50E-07	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	7.63E-05	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.25E-06	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.51E-04	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.02E-04	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	4.57E-07	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	1.30E-06	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	9.00E-10	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	1.41E-09	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	1.87E-01	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	6.82E-06	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.34E-04	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.41E-03	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	5.30E-06	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.66E-06	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	4.48E-04	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.71E-04	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.25E-04	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	4.42E-05	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.96E-01	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.02E-04	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.09E-02	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	5.33E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.49E-04	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	8.65E-04	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	3.47E-05	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	2.62E-05	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	1.75E-06	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	8.90E-04	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.45E-05	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.76E-03	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.19E-03	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	5.33E-06	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	1.52E-05	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	1.05E-08	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	1.65E-08	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.23E-06	=	[	9.6E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.00E-10	=	[	3.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.89E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.06E-07	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.33E-10	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.61E-10	=	[	1.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.97E-08	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.20E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.43E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.95E-09	=	[	2.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.06E-05	=	[	3.6E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.88E-09	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.79E-07	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.35E-09	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.54E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	3.81E-08	=	[	4.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.53E-09	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.15E-09	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.69E-11	=	[	9.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.92E-08	=	[	4.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.40E-10	=	[	7.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.77E-08	=	[	9.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.26E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.35E-10	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	6.69E-10	=	[	7.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.63E-13	=	[	5.4E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	7.26E-13	=	[	8.5E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.60E-05	=	[	9.6E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.50E-09	=	[	3.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.24E-06	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.72E-09	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.88E-09	=	[	1.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.30E-07	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.39E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.27E-08	=	[	2.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.57E-04	=	[	3.6E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.04E-07	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.59E-06	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.79E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	4.44E-07	=	[	4.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.78E-08	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.35E-08	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.97E-10	=	[	9.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.57E-07	=	[	4.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.47E-09	=	[	7.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	9.06E-07	=	[	9.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.13E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	2.74E-09	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	7.81E-09	=	[	7.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	5.40E-12	=	[	5.4E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	8.47E-12	=	[	8.5E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	4.82E-07	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	4.40E-10	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	6.40E-08	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	1.82E-07	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	5.62E-06	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	5.13E-09	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	7.47E-07	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	2.13E-06	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.60E-02	x	0.00E+00	=	0.00E+00	1.87E-01	/	1.00E+00	=	1.87E-01
Antimony	5.85E-07	x	0.00E+00	=	0.00E+00	6.82E-06	/	4.00E-04	=	1.71E-02
Arsenic	1.15E-05	x	1.50E+00	=	1.72E-05	1.34E-04	/	3.00E-04	=	4.46E-01
Barium	2.07E-04	x	0.00E+00	=	0.00E+00	2.41E-03	/	2.00E-01	=	1.21E-02
Beryllium	4.54E-07	x	0.00E+00	=	0.00E+00	5.30E-06	/	2.00E-03	=	2.65E-03
Cadmium	3.14E-07	x	0.00E+00	=	0.00E+00	3.66E-06	/	1.00E-03	=	3.66E-03
Chromium	3.84E-05	x	0.00E+00	=	0.00E+00	4.48E-04	/	3.00E-03	=	1.49E-01
Cobalt	2.33E-05	x	0.00E+00	=	0.00E+00	2.71E-04	/	3.00E-04	=	9.05E-01
Copper	2.79E-05	x	0.00E+00	=	0.00E+00	3.25E-04	/	4.00E-02	=	8.13E-03
Fluoride	3.79E-06	x	0.00E+00	=	0.00E+00	4.42E-05	/	4.00E-02	=	1.10E-03
Iron	5.96E-02	x	0.00E+00	=	0.00E+00	6.96E-01	/	7.00E-01	=	9.94E-01
Lithium	1.73E-05	x	0.00E+00	=	0.00E+00	2.02E-04	/	2.00E-03	=	1.01E-01
Manganese	9.33E-04	x	0.00E+00	=	0.00E+00	1.09E-02	/	1.40E-01	=	7.77E-02
Molybdenum	4.57E-06	x	0.00E+00	=	0.00E+00	5.33E-05	/	5.00E-03	=	1.07E-02
Nickel	2.99E-05	x	0.00E+00	=	0.00E+00	3.49E-04	/	2.00E-02	=	1.74E-02
Nitrate	7.42E-05	x	0.00E+00	=	0.00E+00	8.65E-04	/	7.10E+00	=	1.22E-04
Nitrite	2.97E-06	x	0.00E+00	=	0.00E+00	3.47E-05	/	3.00E-01	=	1.16E-04
Selenium	2.25E-06	x	0.00E+00	=	0.00E+00	2.62E-05	/	5.00E-03	=	5.24E-03
Silver	1.50E-07	x	0.00E+00	=	0.00E+00	1.75E-06	/	5.00E-03	=	3.49E-04
Strontium	7.63E-05	x	0.00E+00	=	0.00E+00	8.90E-04	/	6.00E-01	=	1.48E-03
Total Uranium	1.25E-06	x	0.00E+00	=	0.00E+00	1.45E-05	/	3.00E-03	=	4.85E-03
Vanadium	1.51E-04	x	0.00E+00	=	0.00E+00	1.76E-03	/	5.00E-03	=	3.53E-01
Zinc	1.02E-04	x	0.00E+00	=	0.00E+00	1.19E-03	/	3.00E-01	=	3.98E-03
Butylbenzylphthalate	4.57E-07	x	1.90E-03	=	8.69E-10	5.33E-06	/	2.00E-01	=	2.67E-05
Di-n-butylphthalate	1.30E-06	x	0.00E+00	=	0.00E+00	1.52E-05	/	1.00E-01	=	1.52E-04
Styrene	9.00E-10	x	0.00E+00	=	0.00E+00	1.05E-08	/	2.00E-01	=	5.25E-08
Toluene	1.41E-09	x	0.00E+00	=	0.00E+00	1.65E-08	/	8.00E-02	=	2.06E-07
			Pathway total	=	1.72E-05			Pathway total	=	3.30E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.23E-06	x		=	NA	9.60E-05	/[	5.00E-03	x	1000	]=	1.92E-05
Antimony	3.00E-10	x		=	NA	3.50E-09	/[		x	1000	]=	NA
Arsenic	5.89E-09	x	4.30E-03	=	2.53E-11	6.88E-08	/[	1.50E-05	x	1000	]=	4.58E-06
Barium	1.06E-07	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.48E-06
Beryllium	2.33E-10	x	2.40E-03	=	5.60E-13	2.72E-09	/[	2.00E-05	x	1001	]=	1.36E-07
Cadmium	1.61E-10	x	1.80E-03	=	2.90E-13	1.88E-09	/[	1.00E-05	x	1002	]=	1.88E-07
Chromium	1.97E-08	x	8.40E-02	=	1.66E-09	2.30E-07	/[	1.00E-04	x	1003	]=	2.29E-06
Cobalt	1.20E-08	x	9.00E-03	=	1.08E-10	1.39E-07	/[	6.00E-06	x	1004	]=	2.32E-05
Copper	1.43E-08	x		=	NA	1.67E-07	/[		x	1005	]=	NA
Fluoride	1.95E-09	x		=	NA	2.27E-08	/[	1.30E-02	x	1000	]=	1.75E-09
Iron	3.06E-05	x		=	NA	3.57E-04	/[		x	1000	]=	NA
Lithium	8.88E-09	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Manganese	4.79E-07	x		=	NA	5.59E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Molybdenum	2.35E-09	x	0.00E+00	=	0.00E+00	2.74E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.54E-08	x	2.60E-04	=	3.99E-12	1.79E-07	/[	9.00E-05	x	1000	]=	1.99E-06
Nitrate	3.81E-08	x		=	NA	4.44E-07	/[		x	1000	]=	NA
Nitrite	1.53E-09	x		=	NA	1.78E-08	/[		x	1000	]=	NA
Selenium	1.15E-09	x	0.00E+00	=	0.00E+00	1.35E-08	/[	2.00E-02	x	1000	]=	6.73E-10
Silver	7.69E-11	x		=	NA	8.97E-10	/[		x	1000	]=	NA
Strontium	3.92E-08	x		=	NA	4.57E-07	/[		x	1000	]=	NA
Total Uranium	6.40E-10	x		=	NA	7.47E-09	/[	4.00E-05	x	1000	]=	1.87E-07
Vanadium	7.77E-08	x		=	NA	9.06E-07	/[	1.00E-04	x	1000	]=	9.06E-06
Zinc	5.26E-08	x		=	NA	6.13E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.35E-10	x	0.00E+00	=	0.00E+00	2.74E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	6.69E-10	x	0.00E+00	=	0.00E+00	7.81E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.63E-13	x	0.00E+00	=	0.00E+00	5.40E-12	/[	1.00E+00	x	1000	]=	5.40E-15
Toluene	7.26E-13	x	0.00E+00	=	0.00E+00	8.47E-12	/	5.00E+00	x	1000	]=	1.69E-15
			Pathway total =		1.79E-09					Pathway total =		1.75E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.82E-07	x	1.50E+00	=	7.23E-07	5.62E-06	/	3.00E-04	=	1.87E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.40E-10	x		=	NA	5.13E-09	/	2.50E-05	=	2.05E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	6.40E-08	x	1.90E-03	=	1.22E-10	7.47E-07	/	2.00E-01	=	3.73E-06
Di-n-butylphthalate	1.82E-07	x		=	NA	2.13E-06	/	1.00E-01	=	2.13E-05
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		7.23E-07			Pathway total =		1.90E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.9E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-02	1%
Arsenic	Sum of all pathways	=	1.79E-05	100%	Sum of all pathways	=	**4.6E-01**	14%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02	0%
Beryllium	Sum of all pathways	=	5.60E-13	0%	Sum of all pathways	=	2.7E-03	0%
Cadmium	Sum of all pathways	=	2.90E-13	0%	Sum of all pathways	=	3.9E-03	0%
Chromium	Sum of all pathways	=	1.66E-09	0%	Sum of all pathways	=	**1.5E-01**	4%
Cobalt	Sum of all pathways	=	1.08E-10	0%	Sum of all pathways	=	**9.0E-01**	27%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.1E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.9E-01**	30%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.0E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**7.8E-02**	2%
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Nickel	Sum of all pathways	=	3.99E-12	0%	Sum of all pathways	=	1.7E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-04	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	5.2E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	4.8E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.5E-01**	11%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	9.90E-10	0%	Sum of all pathways	=	3.0E-05	0%
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-04	0%
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	5.3E-08	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-07	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.79E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.32E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.77E-02	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	4.94E-06	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.80E-05	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	5.58E-04	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	7.50E-07	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Boron	1.00E-04	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	2.58E-07	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.65E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	1.89E-05	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	3.15E-05	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	3.50E-06	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.51E-02	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.98E-05	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.75E-04	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	3.70E-08	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	3.13E-05	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	2.11E-05	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	5.71E-06	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.43E-07	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	2.86E-04	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Tin	8.23E-06	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.49E-06	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.24E-04	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.20E-04	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.73E-06	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.78E-07	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.06E-01	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	5.76E-05	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	2.10E-04	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	6.51E-03	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	8.75E-06	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Boron	1.17E-03	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.01E-06	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	3.09E-04	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.21E-04	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.68E-04	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	4.08E-05	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.43E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.31E-04	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.02E-02	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	4.32E-07	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.65E-04	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	2.46E-04	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	6.67E-05	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	1.66E-06	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	3.33E-03	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Tin	9.60E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.73E-05	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.45E-03	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.39E-03	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	5.52E-05	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.07E-06	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.09E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.54E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	9.26E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	2.86E-07	=	[	3.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.85E-10	=	[	4.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	5.15E-08	=	[	6.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.33E-10	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.36E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.71E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.62E-08	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.80E-09	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.83E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.02E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.50E-07	=	[	5.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.90E-11	=	[	2.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.61E-08	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.94E-09	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.33E-11	=	[	8.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	1.47E-07	=	[	1.7E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	4.23E-09	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.64E-10	=	[	8.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.38E-08	=	[	7.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	6.14E-08	=	[	7.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.43E-09	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.14E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	1.06E-04	=	[1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.96E-08	=	[3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	1.08E-07	=	[1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	3.34E-06	=	[3.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	4.49E-09	=	[4.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	6.01E-07	=	[6.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.55E-09	=	[1.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.59E-07	=	[1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.13E-07	=	[1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.89E-07	=	[1.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.10E-08	=	[2.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.30E-04	=	[3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.19E-07	=	[1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.25E-06	=	[5.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.22E-10	=	[2.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.88E-07	=	[1.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.26E-07	=	[1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	3.42E-08	=	[3.4E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.55E-10	=	[8.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	1.71E-06	=	[1.7E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	4.93E-08	=	[4.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.91E-09	=	[8.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.44E-07	=	[7.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	7.16E-07	=	[7.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.84E-08	=	[2.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.07E-09	=	[1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	7.57E-07	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.62E-10	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.62E-07	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.49E-08	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	8.84E-06	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	4.22E-09	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	7.73E-06	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.90E-07	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.77E-02	x	0.00E+00	=	0.00E+00	2.06E-01	/	1.00E+00	=	2.06E-01
Antimony	4.94E-06	x	0.00E+00	=	0.00E+00	5.76E-05	/	4.00E-04	=	1.44E-01
Arsenic	1.80E-05	x	1.50E+00	=	2.71E-05	2.10E-04	/	3.00E-04	=	7.01E-01
Barium	5.58E-04	x	0.00E+00	=	0.00E+00	6.51E-03	/	2.00E-01	=	3.25E-02
Beryllium	7.50E-07	x	0.00E+00	=	0.00E+00	8.75E-06	/	2.00E-03	=	4.37E-03
Boron	1.00E-04	x	0.00E+00	=	0.00E+00	1.17E-03	/	2.00E-01	=	5.85E-03
Cadmium	2.58E-07	x	0.00E+00	=	0.00E+00	3.01E-06	/	1.00E-03	=	3.01E-03
Chromium	2.65E-05	x	0.00E+00	=	0.00E+00	3.09E-04	/	3.00E-03	=	1.03E-01
Cobalt	1.89E-05	x	0.00E+00	=	0.00E+00	2.21E-04	/	3.00E-04	=	7.35E-01
Copper	3.15E-05	x	0.00E+00	=	0.00E+00	3.68E-04	/	4.00E-02	=	9.20E-03
Fluoride	3.50E-06	x	0.00E+00	=	0.00E+00	4.08E-05	/	4.00E-02	=	1.02E-03
Iron	5.51E-02	x	0.00E+00	=	0.00E+00	6.43E-01	/	7.00E-01	=	9.18E-01
Lithium	1.98E-05	x	0.00E+00	=	0.00E+00	2.31E-04	/	2.00E-03	=	1.16E-01
Manganese	8.75E-04	x	0.00E+00	=	0.00E+00	1.02E-02	/	1.40E-01	=	7.30E-02
Mercury	3.70E-08	x	0.00E+00	=	0.00E+00	4.32E-07	/	0.00E+00	=	NA
Nickel	3.13E-05	x	0.00E+00	=	0.00E+00	3.65E-04	/	2.00E-02	=	1.83E-02
Nitrate	2.11E-05	x	0.00E+00	=	0.00E+00	2.46E-04	/	7.10E+00	=	3.47E-05
Nitrite	5.71E-06	x	0.00E+00	=	0.00E+00	6.67E-05	/	3.00E-01	=	2.22E-04
Silver	1.43E-07	x	0.00E+00	=	0.00E+00	1.66E-06	/	5.00E-03	=	3.33E-04
Strontium	2.86E-04	x	0.00E+00	=	0.00E+00	3.33E-03	/	6.00E-01	=	5.56E-03
Tin	8.23E-06	x	0.00E+00	=	0.00E+00	9.60E-05	/	6.00E-01	=	1.60E-04
Total Uranium	1.49E-06	x	0.00E+00	=	0.00E+00	1.73E-05	/	3.00E-03	=	5.78E-03
Vanadium	1.24E-04	x	0.00E+00	=	0.00E+00	1.45E-03	/	5.00E-03	=	2.90E-01
Zinc	1.20E-04	x	0.00E+00	=	0.00E+00	1.39E-03	/	3.00E-01	=	4.65E-03
Bis(2-ethylhexyl) phthalate	4.73E-06	x	1.40E-02	=	6.62E-08	5.52E-05	/	2.00E-02	=	2.76E-03
Butylbenzylphthalate	1.78E-07	x	1.90E-03	=	3.38E-10	2.07E-06	/	2.00E-01	=	1.04E-05
			Pathway total	=	2.71E-05			Pathway total	=	3.38E+00

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.09E-06	x		=	NA	1.06E-04	/[	5.00E-03	x	1000	]=	2.12E-05
Antimony	2.54E-09	x		=	NA	2.96E-08	/[		x	1000	]=	NA
Arsenic	9.26E-09	x	4.30E-03	=	3.98E-11	1.08E-07	/[	1.50E-05	x	1000	]=	7.21E-06
Barium	2.86E-07	x		=	NA	3.34E-06	/[	5.00E-04	x	1000	]=	6.68E-06
Beryllium	3.85E-10	x	2.40E-03	=	9.24E-13	4.49E-09	/[	2.00E-05	x	1000	]=	2.25E-07
Boron	5.15E-08	x	0.00E+00	=	0.00E+00	6.01E-07	/[	2.00E-02	x	1000	]=	3.01E-08
Cadmium	1.33E-10	x	1.80E-03	=	2.39E-13	1.55E-09	/[	1.00E-05	x	1000	]=	1.55E-07
Chromium	1.36E-08	x	8.40E-02	=	1.14E-09	1.59E-07	/[	1.00E-04	x	1000	]=	1.59E-06
Cobalt	9.71E-09	x	9.00E-03	=	8.74E-11	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.62E-08	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Fluoride	1.80E-09	x		=	NA	2.10E-08	/[	1.30E-02	x	1000	]=	1.61E-09
Iron	2.83E-05	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.02E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	4.50E-07	x		=	NA	5.25E-06	/[	5.00E-05	x	1000	]=	1.05E-04
Mercury	1.90E-11	x	0.00E+00	=	0.00E+00	2.22E-10	/[	3.00E-04	x	1000	]=	7.40E-10
Nickel	1.61E-08	x	2.60E-04	=	4.18E-12	1.88E-07	/[	9.00E-05	x	1000	]=	2.09E-06
Nitrate	1.08E-08	x		=	NA	1.26E-07	/[		x	1000	]=	NA
Nitrite	2.94E-09	x		=	NA	3.42E-08	/[		x	1000	]=	NA
Silver	7.33E-11	x		=	NA	8.55E-10	/[		x	1000	]=	NA
Strontium	1.47E-07	x		=	NA	1.71E-06	/[		x	1000	]=	NA
Tin	4.23E-09	x		=	NA	4.93E-08	/[		x	1000	]=	NA
Total Uranium	7.64E-10	x		=	NA	8.91E-09	/[	4.00E-05	x	1000	]=	2.23E-07
Vanadium	6.38E-08	x		=	NA	7.44E-07	/[	1.00E-04	x	1000	]=	7.44E-06
Zinc	6.14E-08	x		=	NA	7.16E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.43E-09	x	2.40E-06	=	5.83E-15	2.84E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	9.14E-11	x	0.00E+00	=	0.00E+00	1.07E-09	/		x	1000	]=	NA
			Pathway total =		1.28E-09					Pathway total =		1.71E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.57E-07	x	1.50E+00	=	1.14E-06	8.84E-06	/	3.00E-04	=	2.95E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	3.62E-10	x		=	NA	4.22E-09	/	2.50E-05	=	1.69E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	6.62E-07	x	1.40E-02	=	9.27E-09	7.73E-06	/	2.00E-02	=	3.86E-04
Butylbenzylphthalate	2.49E-08	x	1.90E-03	=	4.73E-11	2.90E-07	/	2.00E-01	=	1.45E-06
			Pathway total =		1.15E-06			Pathway total =		3.00E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Con	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.1E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	**1.4E-01**	4%
Arsenic	Sum of all pathways	=	2.82E-05	100%	Sum of all pathways	=	**7.3E-01**	21%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-02	1%
Beryllium	Sum of all pathways	=	9.24E-13	0%	Sum of all pathways	=	4.4E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	5.9E-03	0%
Cadmium	Sum of all pathways	=	2.39E-13	0%	Sum of all pathways	=	3.2E-03	0%
Chromium	Sum of all pathways	=	1.14E-09	0%	Sum of all pathways	=	**1.0E-01**	3%
Cobalt	Sum of all pathways	=	8.74E-11	0%	Sum of all pathways	=	**7.4E-01**	22%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.2E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.2E-01**	27%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.2E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**7.3E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-10	0%
Nickel	Sum of all pathways	=	4.18E-12	0%	Sum of all pathways	=	1.8E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	5.6E-03	0%
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.8E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**2.9E-01**	8%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.6E-03	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.55E-08	0%	Sum of all pathways	=	3.1E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	3.85E-10	0%	Sum of all pathways	=	1.2E-05	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.83E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**3.41E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.46E-02	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	6.16E-07	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	8.23E-06	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	1.91E-04	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	3.75E-07	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	2.19E-07	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.21E-05	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	1.89E-05	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	2.78E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	2.89E-06	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	4.81E-02	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.62E-05	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.13E-04	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	3.91E-08	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	5.60E-06	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	3.00E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	1.76E-05	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	7.08E-06	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	3.09E-06	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	2.15E-07	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	7.09E-05	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.57E-06	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.35E-04	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	8.69E-05	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	1.06E-07	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
1-Butanol	5.07E-08	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.21E-06	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.35E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Hexane	1.38E-07	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	5.18E-08	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.71E-01	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	7.18E-06	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	9.60E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.23E-03	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	4.37E-06	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	2.55E-06	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	2.58E-04	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.20E-04	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.25E-04	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	3.37E-05	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	5.62E-01	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	1.89E-04	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	9.49E-03	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	4.56E-07	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	6.53E-05	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	3.50E-04	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	2.05E-04	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	8.27E-05	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	3.60E-05	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	2.51E-06	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	8.27E-04	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.83E-05	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.58E-03	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.01E-03	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	1.23E-06	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
1-Butanol	5.92E-07	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	4.91E-05	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	1.58E-06	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Hexane	1.61E-06	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	6.04E-07	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.51E-06	=	[	8.8E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.16E-10	=	[	3.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.23E-09	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.80E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.92E-10	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.12E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.14E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.70E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.43E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.48E-09	=	[	1.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.47E-05	=	[	2.9E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.30E-09	=	[	9.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.18E-07	=	[	4.9E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.01E-11	=	[	2.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.88E-09	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.54E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	9.02E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.64E-09	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.59E-09	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	1.10E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.64E-08	=	[	4.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	8.07E-10	=	[	9.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.94E-08	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.46E-08	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	5.42E-11	=	[	6.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
1-Butanol	2.61E-11	=	[	3.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.16E-09	=	[	2.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.95E-11	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	7.10E-11	=	[	8.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.66E-11	=	[	3.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.76E-05	=	[	8.8E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.69E-09	=	[	3.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.93E-08	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.14E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.24E-09	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.31E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.33E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.13E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	1.73E-08	=	[	1.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	2.89E-04	=	[	2.9E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	9.68E-08	=	[	9.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.88E-06	=	[	4.9E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.34E-10	=	[	2.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.36E-08	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.80E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.05E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.25E-08	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.85E-08	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.29E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.25E-07	=	[	4.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.42E-09	=	[	9.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.10E-07	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.21E-07	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	6.33E-10	=	[	6.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
1-Butanol	3.04E-10	=	[	3.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.52E-08	=	[	2.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	8.29E-10	=	[	8.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.10E-10	=	[	3.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	3.46E-07	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.06E-10	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
1-Butanol	7.10E-09	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.89E-07	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	1.89E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	7.25E-09	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	4.03E-06	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.57E-09	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
1-Butanol	8.29E-08	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	6.87E-06	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.21E-07	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	NA	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.46E-02	x	0.00E+00	=	0.00E+00	1.71E-01	/	1.00E+00	=	1.71E-01
Antimony	6.16E-07	x	0.00E+00	=	0.00E+00	7.18E-06	/	4.00E-04	=	1.80E-02
Arsenic	8.23E-06	x	1.50E+00	=	1.23E-05	9.60E-05	/	3.00E-04	=	3.20E-01
Barium	1.91E-04	x	0.00E+00	=	0.00E+00	2.23E-03	/	2.00E-01	=	1.11E-02
Beryllium	3.75E-07	x	0.00E+00	=	0.00E+00	4.37E-06	/	2.00E-03	=	2.19E-03
Cadmium	2.19E-07	x	0.00E+00	=	0.00E+00	2.55E-06	/	1.00E-03	=	2.55E-03
Chromium	2.21E-05	x	0.00E+00	=	0.00E+00	2.58E-04	/	3.00E-03	=	8.60E-02
Cobalt	1.89E-05	x	0.00E+00	=	0.00E+00	2.20E-04	/	3.00E-04	=	7.34E-01
Copper	2.78E-05	x	0.00E+00	=	0.00E+00	3.25E-04	/	4.00E-02	=	8.12E-03
Fluoride	2.89E-06	x	0.00E+00	=	0.00E+00	3.37E-05	/	4.00E-02	=	8.43E-04
Iron	4.81E-02	x	0.00E+00	=	0.00E+00	5.62E-01	/	7.00E-01	=	8.02E-01
Lithium	1.62E-05	x	0.00E+00	=	0.00E+00	1.89E-04	/	2.00E-03	=	9.43E-02
Manganese	8.13E-04	x	0.00E+00	=	0.00E+00	9.49E-03	/	1.40E-01	=	6.78E-02
Mercury	3.91E-08	x	0.00E+00	=	0.00E+00	4.56E-07	/	0.00E+00	=	NA
Molybdenum	5.60E-06	x	0.00E+00	=	0.00E+00	6.53E-05	/	5.00E-03	=	1.31E-02
Nickel	3.00E-05	x	0.00E+00	=	0.00E+00	3.50E-04	/	2.00E-02	=	1.75E-02
Nitrate	1.76E-05	x	0.00E+00	=	0.00E+00	2.05E-04	/	7.10E+00	=	2.89E-05
Nitrite	7.08E-06	x	0.00E+00	=	0.00E+00	8.27E-05	/	3.00E-01	=	2.76E-04
Selenium	3.09E-06	x	0.00E+00	=	0.00E+00	3.60E-05	/	5.00E-03	=	7.20E-03
Silver	2.15E-07	x	0.00E+00	=	0.00E+00	2.51E-06	/	5.00E-03	=	5.01E-04
Strontium	7.09E-05	x	0.00E+00	=	0.00E+00	8.27E-04	/	6.00E-01	=	1.38E-03
Total Uranium	1.57E-06	x	0.00E+00	=	0.00E+00	1.83E-05	/	3.00E-03	=	6.11E-03
Vanadium	1.35E-04	x	0.00E+00	=	0.00E+00	1.58E-03	/	5.00E-03	=	3.15E-01
Zinc	8.69E-05	x	0.00E+00	=	0.00E+00	1.01E-03	/	3.00E-01	=	3.38E-03
Acetone	1.06E-07	x	0.00E+00	=	0.00E+00	1.23E-06	/	9.00E-01	=	1.37E-06
1-Butanol	5.07E-08	x	0.00E+00	=	0.00E+00	5.92E-07	/	1.00E-01	=	5.92E-06
Bis(2-ethylhexyl) phthalate	4.21E-06	x	1.40E-02	=	5.89E-08	4.91E-05	/	2.00E-02	=	2.45E-03
Butylbenzylphthalate	1.35E-07	x	1.90E-03	=	2.57E-10	1.58E-06	/	2.00E-01	=	7.89E-06
Hexane	1.38E-07	x	0.00E+00	=	0.00E+00	1.61E-06	/	6.00E-02	=	2.69E-05
beta-BHC	5.18E-08	x	1.80E+00	=	9.32E-08	6.04E-07	/	0.00E+00	=	NA
			Pathway total	=	1.25E-05			Pathway total	=	2.69E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.51E-06	x		=	NA	8.76E-05	/[	5.00E-03	x	1000	]=	1.75E-05
Antimony	3.16E-10	x		=	NA	3.69E-09	/[		x	1000	]=	NA
Arsenic	4.23E-09	x	4.30E-03	=	1.82E-11	4.93E-08	/[	1.50E-05	x	1000	]=	3.29E-06
Barium	9.80E-08	x		=	NA	1.14E-06	/[	5.00E-04	x	1000	]=	2.29E-06
Beryllium	1.92E-10	x	2.40E-03	=	4.62E-13	2.24E-09	/[	2.00E-05	x	1000	]=	1.12E-07
Cadmium	1.12E-10	x	1.80E-03	=	2.02E-13	1.31E-09	/[	1.00E-05	x	1000	]=	1.31E-07
Chromium	1.14E-08	x	8.40E-02	=	9.55E-10	1.33E-07	/[	1.00E-04	x	1000	]=	1.33E-06
Cobalt	9.70E-09	x	9.00E-03	=	8.73E-11	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.43E-08	x		=	NA	1.67E-07	/[		x	1000	]=	NA
Fluoride	1.48E-09	x		=	NA	1.73E-08	/[	1.30E-02	x	1000	]=	1.33E-09
Iron	2.47E-05	x		=	NA	2.89E-04	/[		x	1000	]=	NA
Lithium	8.30E-09	x		=	NA	9.68E-08	/[		x	1000	]=	NA
Manganese	4.18E-07	x		=	NA	4.88E-06	/[	5.00E-05	x	1000	]=	9.75E-05
Mercury	2.01E-11	x	0.00E+00	=	0.00E+00	2.34E-10	/[	3.00E-04	x	1000	]=	7.81E-10
Molybdenum	2.88E-09	x	0.00E+00	=	0.00E+00	3.36E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.54E-08	x	2.60E-04	=	4.01E-12	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	9.02E-09	x		=	NA	1.05E-07	/[		x	1000	]=	NA
Nitrite	3.64E-09	x		=	NA	4.25E-08	/[		x	1000	]=	NA
Selenium	1.59E-09	x	0.00E+00	=	0.00E+00	1.85E-08	/[	2.00E-02	x	1000	]=	9.25E-10
Silver	1.10E-10	x		=	NA	1.29E-09	/[		x	1000	]=	NA
Strontium	3.64E-08	x		=	NA	4.25E-07	/[		x	1000	]=	NA
Total Uranium	8.07E-10	x		=	NA	9.42E-09	/[	4.00E-05	x	1000	]=	2.36E-07
Vanadium	6.94E-08	x		=	NA	8.10E-07	/[	1.00E-04	x	1000	]=	8.10E-06
Zinc	4.46E-08	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Acetone	5.42E-11	x	0.00E+00	=	0.00E+00	6.33E-10	/[	3.10E+01	x	1000	]=	2.04E-14
1-Butanol	2.61E-11	x	0.00E+00	=	0.00E+00	3.04E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.16E-09	x	2.40E-06	=	5.19E-15	2.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.95E-11	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	7.10E-11	x	0.00E+00	=	0.00E+00	8.29E-10	/[	7.00E-01	x	1000	]=	1.18E-12
beta-BHC	2.66E-11	x	5.30E-04	=	1.41E-14	3.10E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.06E-09					Pathway total =		1.51E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.46E-07	x	1.50E+00	=	5.18E-07	4.03E-06	/	3.00E-04	=	1.34E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.06E-10	x		=	NA	3.57E-09	/	2.50E-05	=	1.43E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	7.10E-09	x		=	NA	8.29E-08	/	1.00E-01	=	8.29E-07
Bis(2-ethylhexyl) phthalate	5.89E-07	x	1.40E-02	=	8.24E-09	6.87E-06	/	2.00E-02	=	3.43E-04
Butylbenzylphthalate	1.89E-08	x	1.90E-03	=	3.60E-11	2.21E-07	/	2.00E-01	=	1.11E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	7.25E-09	x	1.80E+00	=	1.30E-08	NA	/		=	NA
			Pathway total =		5.40E-07			Pathway total =		1.39E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.7E-01**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.8E-02	1%
Arsenic	Sum of all pathways	=	1.29E-05	Sum of all pathways	=	**3.3E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02	0%
Beryllium	Sum of all pathways	=	4.62E-13	Sum of all pathways	=	2.2E-03	0%
Cadmium	Sum of all pathways	=	2.02E-13	Sum of all pathways	=	2.7E-03	0%
Chromium	Sum of all pathways	=	9.55E-10	Sum of all pathways	=	**8.6E-02**	3%
Cobalt	Sum of all pathways	=	8.73E-11	Sum of all pathways	=	**7.3E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	8.4E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**8.0E-01**	30%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**9.4E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**6.8E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-10	0%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-02	0%
Nickel	Sum of all pathways	=	4.01E-12	Sum of all pathways	=	1.8E-02	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.9E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.8E-04	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	7.2E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	5.0E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.1E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.2E-01**	12%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.4E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-06	0%
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	6.7E-06	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	6.71E-08	Sum of all pathways	=	2.8E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.93E-10	Sum of all pathways	=	9.0E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05	0%
beta-BHC	Sum of all pathways	=	1.06E-07	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.30E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**2.70E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.63E-02	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	5.38E-07	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.16E-05	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	1.86E-04	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	6.31E-07	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	2.76E-07	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.84E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.09E-05	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	2.92E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	6.57E-06	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.78E-02	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	1.91E-05	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.33E-04	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	4.39E-08	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.54E-05	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	2.61E-05	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	1.05E-05	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	4.05E-07	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	7.58E-05	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Tin	3.29E-05	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	3.58E-06	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.78E-04	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	4.19E-04	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	2.24E-08	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.26E-06	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	1.97E-06	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	3.06E-09	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	6.72E-10	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	5.90E-08	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	6.13E-08	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.90E-01	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	6.27E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.35E-04	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.17E-03	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	7.36E-06	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	3.22E-06	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	3.31E-04	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.44E-04	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.41E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	7.66E-05	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.75E-01	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.23E-04	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	9.71E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	5.12E-07	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	2.96E-04	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	3.05E-04	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	1.23E-04	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	4.73E-06	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	8.84E-04	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Tin	3.84E-04	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	4.18E-05	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	2.07E-03	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	4.89E-03	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	2.61E-07	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	6.13E-05	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	2.30E-05	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	3.57E-08	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	7.84E-09	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	6.88E-07	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	7.15E-07	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.37E-06	=	[	9.8E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.76E-10	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.95E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.57E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.24E-10	=	[	3.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.42E-10	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.46E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.50E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	3.37E-09	=	[	3.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.97E-05	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.82E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.28E-07	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.25E-11	=	[	2.6E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.30E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.34E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	5.41E-09	=	[	6.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	2.08E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.89E-08	=	[	4.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.69E-08	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	1.84E-09	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	9.13E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	2.15E-07	=	[	2.5E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	1.15E-11	=	[	1.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.70E-09	=	[	3.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	1.01E-09	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.57E-12	=	[	1.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.45E-13	=	[	4.0E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	3.03E-11	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.15E-11	=	[	3.7E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.76E-05	=	[	9.8E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.94E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.12E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.78E-09	=	[	3.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.65E-09	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.94E-08	=	[	3.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.47E-04	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.15E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.63E-10	=	[	2.6E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.52E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.57E-07	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	6.31E-08	=	[	6.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	2.43E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.54E-07	=	[	4.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.97E-07	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	2.15E-08	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	2.51E-06	=	[	2.5E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	1.34E-10	=	[	1.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	3.15E-08	=	[	3.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	1.18E-08	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.84E-11	=	[	1.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	4.03E-12	=	[	4.0E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.53E-10	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	3.67E-10	=	[	3.7E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	4.86E-07	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	3.86E-10	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Bis(2-ethylhexyl) phthalate	7.36E-07	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Di-n-butylphthalate	2.76E-07	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
beta-BHC	8.26E-09	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Aroclor-1260	1.20E-08	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	5.67E-06	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	4.51E-09	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Bis(2-ethylhexyl) phthalate	8.59E-06	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Di-n-butylphthalate	3.22E-06	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
beta-BHC	NA	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Aroclor-1260	1.40E-07	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.63E-02	x	0.00E+00	=	0.00E+00	1.90E-01	/	1.00E+00	=	1.90E-01
Antimony	5.38E-07	x	0.00E+00	=	0.00E+00	6.27E-06	/	4.00E-04	=	1.57E-02
Arsenic	1.16E-05	x	1.50E+00	=	1.74E-05	1.35E-04	/	3.00E-04	=	4.50E-01
Barium	1.86E-04	x	0.00E+00	=	0.00E+00	2.17E-03	/	2.00E-01	=	1.09E-02
Beryllium	6.31E-07	x	0.00E+00	=	0.00E+00	7.36E-06	/	2.00E-03	=	3.68E-03
Cadmium	2.76E-07	x	0.00E+00	=	0.00E+00	3.22E-06	/	1.00E-03	=	3.22E-03
Chromium	2.84E-05	x	0.00E+00	=	0.00E+00	3.31E-04	/	3.00E-03	=	1.10E-01
Cobalt	2.09E-05	x	0.00E+00	=	0.00E+00	2.44E-04	/	3.00E-04	=	8.14E-01
Copper	2.92E-05	x	0.00E+00	=	0.00E+00	3.41E-04	/	4.00E-02	=	8.51E-03
Fluoride	6.57E-06	x	0.00E+00	=	0.00E+00	7.66E-05	/	4.00E-02	=	1.92E-03
Iron	5.78E-02	x	0.00E+00	=	0.00E+00	6.75E-01	/	7.00E-01	=	9.64E-01
Lithium	1.91E-05	x	0.00E+00	=	0.00E+00	2.23E-04	/	2.00E-03	=	1.12E-01
Manganese	8.33E-04	x	0.00E+00	=	0.00E+00	9.71E-03	/	1.40E-01	=	6.94E-02
Mercury	4.39E-08	x	0.00E+00	=	0.00E+00	5.12E-07	/	0.00E+00	=	NA
Nickel	2.54E-05	x	0.00E+00	=	0.00E+00	2.96E-04	/	2.00E-02	=	1.48E-02
Nitrate	2.61E-05	x	0.00E+00	=	0.00E+00	3.05E-04	/	7.10E+00	=	4.30E-05
Nitrite	1.05E-05	x	0.00E+00	=	0.00E+00	1.23E-04	/	3.00E-01	=	4.10E-04
Silver	4.05E-07	x	0.00E+00	=	0.00E+00	4.73E-06	/	5.00E-03	=	9.46E-04
Strontium	7.58E-05	x	0.00E+00	=	0.00E+00	8.84E-04	/	6.00E-01	=	1.47E-03
Tin	3.29E-05	x	0.00E+00	=	0.00E+00	3.84E-04	/	6.00E-01	=	6.40E-04
Total Uranium	3.58E-06	x	0.00E+00	=	0.00E+00	4.18E-05	/	3.00E-03	=	1.39E-02
Vanadium	1.78E-04	x	0.00E+00	=	0.00E+00	2.07E-03	/	5.00E-03	=	4.15E-01
Zinc	4.19E-04	x	0.00E+00	=	0.00E+00	4.89E-03	/	3.00E-01	=	1.63E-02
Acetone	2.24E-08	x	0.00E+00	=	0.00E+00	2.61E-07	/	9.00E-01	=	2.90E-07
Bis(2-ethylhexyl) phthalate	5.26E-06	x	1.40E-02	=	7.36E-08	6.13E-05	/	2.00E-02	=	3.07E-03
Di-n-butylphthalate	1.97E-06	x	0.00E+00	=	0.00E+00	2.30E-05	/	1.00E-01	=	2.30E-04
Methylene chloride	3.06E-09	x	2.00E-03	=	6.13E-12	3.57E-08	/	6.00E-03	=	5.96E-06
Toluene	6.72E-10	x	0.00E+00	=	0.00E+00	7.84E-09	/	8.00E-02	=	9.80E-08
beta-BHC	5.90E-08	x	1.80E+00	=	1.06E-07	6.88E-07	/	0.00E+00	=	NA
Aroclor-1260	6.13E-08	x	2.00E+00	=	1.23E-07	7.15E-07	/	0.00E+00	=	NA
			Pathway total	=	1.77E-05			Pathway total	=	3.22E+00

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.37E-06	x		=	NA	9.76E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	2.76E-10	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	5.95E-09	x	4.30E-03	=	2.56E-11	6.94E-08	/[	1.50E-05	x	1000	]=	4.62E-06
Barium	9.57E-08	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Beryllium	3.24E-10	x	2.40E-03	=	7.78E-13	3.78E-09	/[	2.00E-05	x	1000	]=	1.89E-07
Cadmium	1.42E-10	x	1.80E-03	=	2.55E-13	1.65E-09	/[	1.00E-05	x	1000	]=	1.65E-07
Chromium	1.46E-08	x	8.40E-02	=	1.22E-09	1.70E-07	/[	1.00E-04	x	1000	]=	1.70E-06
Cobalt	1.08E-08	x	9.00E-03	=	9.68E-11	1.25E-07	/[	6.00E-06	x	1000	]=	2.09E-05
Copper	1.50E-08	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	3.37E-09	x		=	NA	3.94E-08	/[	1.30E-02	x	1000	]=	3.03E-09
Iron	2.97E-05	x		=	NA	3.47E-04	/[		x	1000	]=	NA
Lithium	9.82E-09	x		=	NA	1.15E-07	/[		x	1000	]=	NA
Manganese	4.28E-07	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.98E-05
Mercury	2.25E-11	x	0.00E+00	=	0.00E+00	2.63E-10	/[	3.00E-04	x	1000	]=	8.77E-10
Nickel	1.30E-08	x	2.60E-04	=	3.39E-12	1.52E-07	/[	9.00E-05	x	1000	]=	1.69E-06
Nitrate	1.34E-08	x		=	NA	1.57E-07	/[		x	1000	]=	NA
Nitrite	5.41E-09	x		=	NA	6.31E-08	/[		x	1000	]=	NA
Silver	2.08E-10	x		=	NA	2.43E-09	/[		x	1000	]=	NA
Strontium	3.89E-08	x		=	NA	4.54E-07	/[		x	1000	]=	NA
Tin	1.69E-08	x		=	NA	1.97E-07	/[		x	1000	]=	NA
Total Uranium	1.84E-09	x		=	NA	2.15E-08	/[	4.00E-05	x	1000	]=	5.37E-07
Vanadium	9.13E-08	x		=	NA	1.07E-06	/[	1.00E-04	x	1000	]=	1.07E-05
Zinc	2.15E-07	x		=	NA	2.51E-06	/[		x	1000	]=	NA
Acetone	1.15E-11	x	0.00E+00	=	0.00E+00	1.34E-10	/[	3.10E+01	x	1000	]=	4.33E-15
Bis(2-ethylhexyl) phthalate	2.70E-09	x	2.40E-06	=	6.48E-15	3.15E-08	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	1.01E-09	x	0.00E+00	=	0.00E+00	1.18E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.57E-12	x	1.00E-08	=	1.57E-20	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	3.45E-13	x	0.00E+00	=	0.00E+00	4.03E-12	/[	5.00E+00	x	1000	]=	8.05E-16
beta-BHC	3.03E-11	x	5.30E-04	=	1.61E-14	3.53E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.15E-11	x	5.70E-04	=	1.79E-14	3.67E-10	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.35E-09					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.86E-07	x	1.50E+00	=	7.29E-07	5.67E-06	/	3.00E-04	=	1.89E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.86E-10	x		=	NA	4.51E-09	/	2.50E-05	=	1.80E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	7.36E-07	x	1.40E-02	=	1.03E-08	8.59E-06	/	2.00E-02	=	4.29E-04
Di-n-butylphthalate	2.76E-07	x		=	NA	3.22E-06	/	1.00E-01	=	3.22E-05
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	8.26E-09	x	1.80E+00	=	1.49E-08	NA	/		=	NA
Aroclor-1260	1.20E-08	x	2.00E+00	=	2.40E-08	1.40E-07	/		=	NA
			Pathway total =		7.78E-07			Pathway total =		1.95E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.9E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02	0%
Arsenic	Sum of all pathways	=	1.81E-05	98%	Sum of all pathways	=	**4.7E-01**	14%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Beryllium	Sum of all pathways	=	7.78E-13	0%	Sum of all pathways	=	3.7E-03	0%
Cadmium	Sum of all pathways	=	2.55E-13	0%	Sum of all pathways	=	3.4E-03	0%
Chromium	Sum of all pathways	=	1.22E-09	0%	Sum of all pathways	=	**1.1E-01**	3%
Cobalt	Sum of all pathways	=	9.68E-11	0%	Sum of all pathways	=	**8.1E-01**	25%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.5E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.6E-01**	30%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.1E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**6.9E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-10	0%
Nickel	Sum of all pathways	=	3.39E-12	0%	Sum of all pathways	=	1.5E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.1E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	9.5E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03	0%
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	6.4E-04	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-02	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**4.1E-01**	13%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02	1%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	8.39E-08	0%	Sum of all pathways	=	3.5E-03	0%
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-04	0%
Methylene chloride	Sum of all pathways	=	6.13E-12	0%	Sum of all pathways	=	6.0E-06	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	9.8E-08	0%
beta-BHC	Sum of all pathways	=	1.21E-07	1%	Sum of all pathways	=	**NA**	
Aroclor-1260	Sum of all pathways	=	1.47E-07	1%	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.84E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.24E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.92E-02	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	5.60E-07	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.33E-05	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	1.81E-04	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	4.00E-07	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	7.93E-06	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.56E-05	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.40E-05	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	3.38E-05	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	8.07E-06	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.92E-02	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	2.07E-05	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	9.35E-04	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	3.09E-08	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.51E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	9.07E-05	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	1.21E-05	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	1.60E-06	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Silver	1.59E-07	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	8.53E-05	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.51E-06	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.47E-04	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.11E-04	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	1.46E-08	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.45E-07	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
2-Hexanone	6.33E-09	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	3.20E-09	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	1.35E-09	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.24E-01	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	6.53E-06	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.55E-04	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.11E-03	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	4.67E-06	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	9.25E-05	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	2.99E-04	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.80E-04	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.95E-04	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	9.41E-05	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.91E-01	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.41E-04	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	1.09E-02	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	3.60E-07	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	2.93E-04	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	1.06E-03	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	1.42E-04	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	1.87E-05	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Silver	1.85E-06	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	9.95E-04	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.76E-05	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.71E-03	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.30E-03	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	1.71E-07	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	2.85E-06	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
2-Hexanone	7.39E-08	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	3.73E-08	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	1.58E-08	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.85E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.88E-10	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	6.85E-09	=	[	8.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.30E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.05E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	4.07E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.32E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.23E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.74E-08	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	4.14E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.04E-05	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.06E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.80E-07	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.59E-11	=	[	1.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.29E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	4.66E-08	=	[	5.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	6.23E-09	=	[	7.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	8.23E-10	=	[	9.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	8.15E-11	=	[	9.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.38E-08	=	[	5.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.75E-10	=	[	9.0E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.54E-08	=	[	8.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.71E-08	=	[	6.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.51E-12	=	[	8.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.26E-10	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Hexanone	3.25E-12	=	[	3.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.64E-12	=	[	1.9E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	6.95E-13	=	[	8.1E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.15E-04	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.36E-09	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	7.99E-08	=	[	8.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.40E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.75E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.53E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.44E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.03E-07	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	4.84E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.55E-04	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.60E-06	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	1.85E-10	=	[	1.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	5.44E-07	=	[	5.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	7.27E-08	=	[	7.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	9.60E-09	=	[	9.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	9.51E-10	=	[	9.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	5.11E-07	=	[	5.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.04E-09	=	[	9.0E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.79E-07	=	[	8.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.66E-07	=	[	6.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.77E-11	=	[	8.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.47E-09	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Hexanone	3.79E-11	=	[	3.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.92E-11	=	[	1.9E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	8.11E-12	=	[	8.1E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	5.60E-07	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	1.11E-08	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	3.42E-08	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	6.53E-06	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	1.30E-07	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	3.99E-07	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.92E-02	x	0.00E+00	=	0.00E+00	2.24E-01	/	1.00E+00	=	2.24E-01
Antimony	5.60E-07	x	0.00E+00	=	0.00E+00	6.53E-06	/	4.00E-04	=	1.63E-02
Arsenic	1.33E-05	x	1.50E+00	=	2.00E-05	1.55E-04	/	3.00E-04	=	5.18E-01
Barium	1.81E-04	x	0.00E+00	=	0.00E+00	2.11E-03	/	2.00E-01	=	1.06E-02
Beryllium	4.00E-07	x	0.00E+00	=	0.00E+00	4.67E-06	/	2.00E-03	=	2.33E-03
Cadmium	7.93E-06	x	0.00E+00	=	0.00E+00	9.25E-05	/	1.00E-03	=	9.25E-02
Chromium	2.56E-05	x	0.00E+00	=	0.00E+00	2.99E-04	/	3.00E-03	=	9.96E-02
Cobalt	2.40E-05	x	0.00E+00	=	0.00E+00	2.80E-04	/	3.00E-04	=	9.33E-01
Copper	3.38E-05	x	0.00E+00	=	0.00E+00	3.95E-04	/	4.00E-02	=	9.87E-03
Fluoride	8.07E-06	x	0.00E+00	=	0.00E+00	9.41E-05	/	4.00E-02	=	2.35E-03
Iron	5.92E-02	x	0.00E+00	=	0.00E+00	6.91E-01	/	7.00E-01	=	9.87E-01
Lithium	2.07E-05	x	0.00E+00	=	0.00E+00	2.41E-04	/	2.00E-03	=	1.21E-01
Manganese	9.35E-04	x	0.00E+00	=	0.00E+00	1.09E-02	/	1.40E-01	=	7.79E-02
Mercury	3.09E-08	x	0.00E+00	=	0.00E+00	3.60E-07	/	0.00E+00	=	NA
Nickel	2.51E-05	x	0.00E+00	=	0.00E+00	2.93E-04	/	2.00E-02	=	1.47E-02
Nitrate	9.07E-05	x	0.00E+00	=	0.00E+00	1.06E-03	/	7.10E+00	=	1.49E-04
Nitrite	1.21E-05	x	0.00E+00	=	0.00E+00	1.42E-04	/	3.00E-01	=	4.72E-04
Selenium	1.60E-06	x	0.00E+00	=	0.00E+00	1.87E-05	/	5.00E-03	=	3.74E-03
Silver	1.59E-07	x	0.00E+00	=	0.00E+00	1.85E-06	/	5.00E-03	=	3.70E-04
Strontium	8.53E-05	x	0.00E+00	=	0.00E+00	9.95E-04	/	6.00E-01	=	1.66E-03
Total Uranium	1.51E-06	x	0.00E+00	=	0.00E+00	1.76E-05	/	3.00E-03	=	5.87E-03
Vanadium	1.47E-04	x	0.00E+00	=	0.00E+00	1.71E-03	/	5.00E-03	=	3.42E-01
Zinc	1.11E-04	x	0.00E+00	=	0.00E+00	1.30E-03	/	3.00E-01	=	4.32E-03
Acetone	1.46E-08	x	0.00E+00	=	0.00E+00	1.71E-07	/	9.00E-01	=	1.90E-07
Butylbenzylphthalate	2.45E-07	x	1.90E-03	=	4.65E-10	2.85E-06	/	2.00E-01	=	1.43E-05
2-Hexanone	6.33E-09	x	0.00E+00	=	0.00E+00	7.39E-08	/	5.00E-03	=	1.48E-05
Methylene chloride	3.20E-09	x	2.00E-03	=	6.40E-12	3.73E-08	/	6.00E-03	=	6.22E-06
Toluene	1.35E-09	x	0.00E+00	=	0.00E+00	1.58E-08	/	8.00E-02	=	1.97E-07
			Pathway total	=	2.00E-05			Pathway total	=	3.47E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.85E-06	x		=	NA	1.15E-04	/[	5.00E-03	x	1000	]=	2.30E-05
Antimony	2.88E-10	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	6.85E-09	x	4.30E-03	=	2.94E-11	7.99E-08	/[	1.50E-05	x	1000	]=	5.32E-06
Barium	9.30E-08	x		=	NA	1.08E-06	/[	5.00E-04	x	1000	]=	2.17E-06
Beryllium	2.05E-10	x	2.40E-03	=	4.93E-13	2.40E-09	/[	2.00E-05	x	1000	]=	1.20E-07
Cadmium	4.07E-09	x	1.80E-03	=	7.33E-12	4.75E-08	/[	1.00E-05	x	1000	]=	4.75E-06
Chromium	1.32E-08	x	8.40E-02	=	1.10E-09	1.53E-07	/[	1.00E-04	x	1000	]=	1.53E-06
Cobalt	1.23E-08	x	9.00E-03	=	1.11E-10	1.44E-07	/[	6.00E-06	x	1000	]=	2.40E-05
Copper	1.74E-08	x		=	NA	2.03E-07	/[		x	1000	]=	NA
Fluoride	4.14E-09	x		=	NA	4.84E-08	/[	1.30E-02	x	1000	]=	3.72E-09
Iron	3.04E-05	x		=	NA	3.55E-04	/[		x	1000	]=	NA
Lithium	1.06E-08	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Manganese	4.80E-07	x		=	NA	5.60E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Mercury	1.59E-11	x	0.00E+00	=	0.00E+00	1.85E-10	/[	3.00E-04	x	1000	]=	6.16E-10
Nickel	1.29E-08	x	2.60E-04	=	3.36E-12	1.51E-07	/[	9.00E-05	x	1000	]=	1.67E-06
Nitrate	4.66E-08	x		=	NA	5.44E-07	/[		x	1000	]=	NA
Nitrite	6.23E-09	x		=	NA	7.27E-08	/[		x	1000	]=	NA
Selenium	8.23E-10	x	0.00E+00	=	0.00E+00	9.60E-09	/[	2.00E-02	x	1000	]=	4.80E-10
Silver	8.15E-11	x		=	NA	9.51E-10	/[		x	1000	]=	NA
Strontium	4.38E-08	x		=	NA	5.11E-07	/[		x	1000	]=	NA
Total Uranium	7.75E-10	x		=	NA	9.04E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	7.54E-08	x		=	NA	8.79E-07	/[	1.00E-04	x	1000	]=	8.79E-06
Zinc	5.71E-08	x		=	NA	6.66E-07	/[		x	1000	]=	NA
Acetone	7.51E-12	x	0.00E+00	=	0.00E+00	8.77E-11	/[	3.10E+01	x	1000	]=	2.83E-15
Butylbenzylphthalate	1.26E-10	x	0.00E+00	=	0.00E+00	1.47E-09	/[		x	1000	]=	NA
2-Hexanone	3.25E-12	x	0.00E+00	=	0.00E+00	3.79E-11	/[	3.00E-02	x	1000	]=	1.26E-12
Methylene chloride	1.64E-12	x	1.00E-08	=	1.64E-20	1.92E-11	/[	6.00E-01	x	1000	]=	3.20E-14
Toluene	6.95E-13	x	0.00E+00	=	0.00E+00	8.11E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		1.26E-09					Pathway total =		1.84E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.60E-07	x	1.50E+00	=	8.40E-07	6.53E-06	/	3.00E-04	=	2.18E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.11E-08	x		=	NA	1.30E-07	/	2.50E-05	=	5.18E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.42E-08	x	1.90E-03	=	6.51E-11	3.99E-07	/	2.00E-01	=	2.00E-06
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		8.40E-07			Pathway total =		2.69E-02

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.2E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02	0%
Arsenic	Sum of all pathways	=	2.08E-05	100%	Sum of all pathways	=	**5.4E-01**	15%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Beryllium	Sum of all pathways	=	4.93E-13	0%	Sum of all pathways	=	2.3E-03	0%
Cadmium	Sum of all pathways	=	7.33E-12	0%	Sum of all pathways	=	**9.8E-02**	3%
Chromium	Sum of all pathways	=	1.10E-09	0%	Sum of all pathways	=	**1.0E-01**	3%
Cobalt	Sum of all pathways	=	1.11E-10	0%	Sum of all pathways	=	**9.3E-01**	27%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.9E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.9E-01**	28%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.2E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**7.8E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-10	0%
Nickel	Sum of all pathways	=	3.36E-12	0%	Sum of all pathways	=	1.5E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-04	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.7E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.9E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.4E-01**	10%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-07	0%
Butylbenzylphthalate	Sum of all pathways	=	5.30E-10	0%	Sum of all pathways	=	1.6E-05	0%
2-Hexanone	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-05	0%
Methylene chloride	Sum of all pathways	=	6.40E-12	0%	Sum of all pathways	=	6.2E-06	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.08E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**3.49E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: CTUIR Resident Child
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.89E-02	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	6.65E-07	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	1.60E-05	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Barium	2.21E-04	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	5.37E-07	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Boron	1.47E-05	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	2.29E-05	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	2.00E-05	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Copper	3.02E-05	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	4.62E-06	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Iron	5.28E-02	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	2.11E-05	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	8.32E-04	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	4.71E-08	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	5.78E-06	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	2.24E-05	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	1.95E-05	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	5.01E-06	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	4.57E-06	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	1.13E-04	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	1.41E-06	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	1.19E-04	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	1.04E-04	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	1.41E-08	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Benzene	7.50E-10	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	8.62E-10	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	1.69E-09	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																					
Aluminum	2.21E-01	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	7.76E-06	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	1.87E-04	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Barium	2.58E-03	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	6.27E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Boron	1.71E-04	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	2.67E-04	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	2.33E-04	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Copper	3.52E-04	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	5.39E-05	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Iron	6.16E-01	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	2.46E-04	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	9.71E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	5.49E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	6.75E-05	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	2.61E-04	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	2.27E-04	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	5.84E-05	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	5.33E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	1.32E-03	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	1.65E-05	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	1.38E-03	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	1.21E-03	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	1.65E-07	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Benzene	8.75E-09	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	1.01E-08	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	1.97E-08	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	15	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.71E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.42E-10	=	[	4.0E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	8.22E-09	=	[	9.6E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.14E-07	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.76E-10	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	7.54E-09	=	[	8.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.17E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.55E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.37E-09	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.71E-05	=	[	3.2E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.27E-07	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.42E-11	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.97E-09	=	[	3.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.15E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	9.99E-09	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.57E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	2.35E-09	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.82E-08	=	[	6.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.25E-10	=	[	8.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.09E-08	=	[	7.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.32E-08	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.26E-12	=	[	8.5E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Benzene	3.85E-13	=	[	4.5E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.43E-13	=	[	5.2E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	8.67E-13	=	[	1.0E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.13E-04	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.99E-09	=	[	4.0E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	9.59E-08	=	[	9.6E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.33E-06	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	8.79E-08	=	[	8.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.37E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.20E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.81E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.77E-08	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.16E-04	=	[	3.2E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.27E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.47E-08	=	[	3.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.34E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.17E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	3.00E-08	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	6.79E-07	=	[	6.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.46E-09	=	[	8.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.11E-07	=	[	7.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.21E-07	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.47E-11	=	[	8.5E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Benzene	4.49E-12	=	[	4.5E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	5.16E-12	=	[	5.2E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	1.01E-11	=	[	1.0E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: CTUIR Resident Child
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	6.72E-07	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	7.84E-06	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
CTUIR Resident Child Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.89E-02	x	0.00E+00	=	0.00E+00	2.21E-01	/	1.00E+00	=	2.21E-01
Antimony	6.65E-07	x	0.00E+00	=	0.00E+00	7.76E-06	/	4.00E-04	=	1.94E-02
Arsenic	1.60E-05	x	1.50E+00	=	2.40E-05	1.87E-04	/	3.00E-04	=	6.22E-01
Barium	2.21E-04	x	0.00E+00	=	0.00E+00	2.58E-03	/	2.00E-01	=	1.29E-02
Beryllium	5.37E-07	x	0.00E+00	=	0.00E+00	6.27E-06	/	2.00E-03	=	3.13E-03
Boron	1.47E-05	x	0.00E+00	=	0.00E+00	1.71E-04	/	2.00E-01	=	8.56E-04
Chromium	2.29E-05	x	0.00E+00	=	0.00E+00	2.67E-04	/	3.00E-03	=	8.89E-02
Cobalt	2.00E-05	x	0.00E+00	=	0.00E+00	2.33E-04	/	3.00E-04	=	7.76E-01
Copper	3.02E-05	x	0.00E+00	=	0.00E+00	3.52E-04	/	4.00E-02	=	8.80E-03
Fluoride	4.62E-06	x	0.00E+00	=	0.00E+00	5.39E-05	/	4.00E-02	=	1.35E-03
Iron	5.28E-02	x	0.00E+00	=	0.00E+00	6.16E-01	/	7.00E-01	=	8.80E-01
Lithium	2.11E-05	x	0.00E+00	=	0.00E+00	2.46E-04	/	2.00E-03	=	1.23E-01
Manganese	8.32E-04	x	0.00E+00	=	0.00E+00	9.71E-03	/	1.40E-01	=	6.93E-02
Mercury	4.71E-08	x	0.00E+00	=	0.00E+00	5.49E-07	/	0.00E+00	=	NA
Molybdenum	5.78E-06	x	0.00E+00	=	0.00E+00	6.75E-05	/	5.00E-03	=	1.35E-02
Nickel	2.24E-05	x	0.00E+00	=	0.00E+00	2.61E-04	/	2.00E-02	=	1.31E-02
Nitrate	1.95E-05	x	0.00E+00	=	0.00E+00	2.27E-04	/	7.10E+00	=	3.20E-05
Nitrite	5.01E-06	x	0.00E+00	=	0.00E+00	5.84E-05	/	3.00E-01	=	1.95E-04
Selenium	4.57E-06	x	0.00E+00	=	0.00E+00	5.33E-05	/	5.00E-03	=	1.07E-02
Strontium	1.13E-04	x	0.00E+00	=	0.00E+00	1.32E-03	/	6.00E-01	=	2.20E-03
Total Uranium	1.41E-06	x	0.00E+00	=	0.00E+00	1.65E-05	/	3.00E-03	=	5.49E-03
Vanadium	1.19E-04	x	0.00E+00	=	0.00E+00	1.38E-03	/	5.00E-03	=	2.77E-01
Zinc	1.04E-04	x	0.00E+00	=	0.00E+00	1.21E-03	/	3.00E-01	=	4.03E-03
Acetone	1.41E-08	x	0.00E+00	=	0.00E+00	1.65E-07	/	9.00E-01	=	1.83E-07
Benzene	7.50E-10	x	5.50E-02	=	4.12E-11	8.75E-09	/	4.00E-03	=	2.19E-06
Styrene	8.62E-10	x	0.00E+00	=	0.00E+00	1.01E-08	/	2.00E-01	=	5.03E-08
Toluene	1.69E-09	x	0.00E+00	=	0.00E+00	1.97E-08	/	8.00E-02	=	2.46E-07
			Pathway total	=	2.40E-05			Pathway total	=	3.15E+00

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.71E-06	x		=	NA	1.13E-04	/[	5.00E-03	x	1000	]=	2.27E-05
Antimony	3.42E-10	x		=	NA	3.99E-09	/[		x	1000	]=	NA
Arsenic	8.22E-09	x	4.30E-03	=	3.53E-11	9.59E-08	/[	1.50E-05	x	1000	]=	6.39E-06
Barium	1.14E-07	x		=	NA	1.33E-06	/[	5.00E-04	x	1000	]=	2.65E-06
Beryllium	2.76E-10	x	2.40E-03	=	6.62E-13	3.22E-09	/[	2.00E-05	x	1000	]=	1.61E-07
Boron	7.54E-09	x	0.00E+00	=	0.00E+00	8.79E-08	/[	2.00E-02	x	1000	]=	4.40E-09
Chromium	1.17E-08	x	8.40E-02	=	9.86E-10	1.37E-07	/[	1.00E-04	x	1000	]=	1.37E-06
Cobalt	1.03E-08	x	9.00E-03	=	9.23E-11	1.20E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	1.55E-08	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	2.37E-09	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	2.71E-05	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	1.08E-08	x		=	NA	1.27E-07	/[		x	1000	]=	NA
Manganese	4.27E-07	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.97E-05
Mercury	2.42E-11	x	0.00E+00	=	0.00E+00	2.82E-10	/[	3.00E-04	x	1000	]=	9.41E-10
Molybdenum	2.97E-09	x	0.00E+00	=	0.00E+00	3.47E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.15E-08	x	2.60E-04	=	2.99E-12	1.34E-07	/[	9.00E-05	x	1000	]=	1.49E-06
Nitrate	9.99E-09	x		=	NA	1.17E-07	/[		x	1000	]=	NA
Nitrite	2.57E-09	x		=	NA	3.00E-08	/[		x	1000	]=	NA
Selenium	2.35E-09	x	0.00E+00	=	0.00E+00	2.74E-08	/[	2.00E-02	x	1000	]=	1.37E-09
Strontium	5.82E-08	x		=	NA	6.79E-07	/[		x	1000	]=	NA
Total Uranium	7.25E-10	x		=	NA	8.46E-09	/[	4.00E-05	x	1000	]=	2.11E-07
Vanadium	6.09E-08	x		=	NA	7.11E-07	/[	1.00E-04	x	1000	]=	7.11E-06
Zinc	5.32E-08	x		=	NA	6.21E-07	/[		x	1000	]=	NA
Acetone	7.26E-12	x	0.00E+00	=	0.00E+00	8.47E-11	/[	3.10E+01	x	1000	]=	2.73E-15
Benzene	3.85E-13	x	7.80E-06	=	3.00E-18	4.49E-12	/[	3.00E-02	x	1000	]=	1.50E-13
Styrene	4.43E-13	x	0.00E+00	=	0.00E+00	5.16E-12	/[	1.00E+00	x	1000	]=	5.16E-15
Toluene	8.67E-13	x	0.00E+00	=	0.00E+00	1.01E-11	/[	5.00E+00	x	1000	]=	2.02E-15
			Pathway total =		1.12E-09					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.72E-07	x	1.50E+00	=	1.01E-06	7.84E-06	/	3.00E-04	=	2.61E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.01E-06			Pathway total =		2.61E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

			Carcinogenic Effects	% Cont				Noncarcinogenic Effects	% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=		**2.2E-01**	7%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=		1.9E-02	1%
Arsenic	Sum of all pathways	=	2.50E-05	100%	Sum of all pathways	=		**6.5E-01**	20%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=		1.3E-02	0%
Beryllium	Sum of all pathways	=	6.62E-13	0%	Sum of all pathways	=		3.1E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=		8.6E-04	0%
Chromium	Sum of all pathways	=	9.86E-10	0%	Sum of all pathways	=		**8.9E-02**	3%
Cobalt	Sum of all pathways	=	9.23E-11	0%	Sum of all pathways	=		**7.8E-01**	24%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=		8.8E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=		1.3E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=		**8.8E-01**	28%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=		**1.2E-01**	4%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=		**6.9E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=		9.4E-10	0%
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=		1.3E-02	0%
Nickel	Sum of all pathways	=	2.99E-12	0%	Sum of all pathways	=		1.3E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=		3.2E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=		1.9E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=		1.1E-02	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=		2.2E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=		5.5E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=		**2.8E-01**	9%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=		4.0E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=		1.8E-07	0%
Benzene	Sum of all pathways	=	4.12E-11	0%	Sum of all pathways	=		2.2E-06	0%
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=		5.0E-08	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=		2.5E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.50E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**3.18E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for CTUIR Resident Child

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	1E-05	7E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	2E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	8E-07	6E-07	7E-07	1E-06	5E-07	8E-07	8E-07	1E-06
ELCR	1E-05	8E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	3E-05
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	2.9	5.1	3.2	2.8	3.3	3.4	2.7	3.2	3.5	3.2
Inhalation	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04
Dermal Contact	0.02	0.08	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.03
HI	**2.9**	**5.2**	**3.2**	**2.8**	**3.3**	**3.4**	**2.7**	**3.2**	**3.5**	**3.2**

Appendix C

Attachment C-12: Results of Nonradiological Risk Assessment under Yakama Residential Adult Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.97E-02	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	6.93E-07	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	9.80E-06	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.22E-04	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	2.53E-07	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	2.49E-05	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.38E-05	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.33E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	5.81E-06	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.29E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.18E-05	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	9.25E-04	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	2.83E-05	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.37E-05	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	2.42E-06	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	1.26E-07	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	9.86E-05	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	3.03E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.51E-06	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.57E-04	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.19E-04	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Diethylphthalate	8.88E-07	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1254	1.97E-08	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.16E-02	=	[	7.55E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	7.58E-07	=	[	2.65E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.07E-05	=	[	3.75E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.43E-04	=	[	8.50E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	2.76E-07	=	[	9.67E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	2.72E-05	=	[	9.54E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.60E-05	=	[	9.09E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.64E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	6.36E-06	=	[	2.23E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.88E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.38E-05	=	[	8.33E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.01E-03	=	[	3.54E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.10E-05	=	[	1.08E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.59E-05	=	[	9.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	2.64E-06	=	[	9.25E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	1.38E-07	=	[	4.83E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.08E-04	=	[	3.77E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	3.31E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.65E-06	=	[	5.77E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.71E-04	=	[	6.00E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.30E-04	=	[	4.56E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Diethylphthalate	9.71E-07	=	[	3.40E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1254	2.15E-08	=	[	7.54E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	9.46E-05	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.32E-09	=	[	3.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.70E-08	=	[	5.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.06E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.21E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.19E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.14E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.79E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.02E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.04E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.43E-06	=	[	4.8E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.36E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.14E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.16E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	6.05E-10	=	[	6.6E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.73E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	1.45E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	7.23E-09	=	[	7.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.51E-07	=	[	8.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.71E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Diethylphthalate	4.26E-09	=	[	4.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1254	9.44E-11	=	[	1.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.03E-04	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.63E-09	=	[	3.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	5.14E-08	=	[	5.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.16E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.33E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.31E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.25E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.05E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.14E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.85E-06	=	[	4.8E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.49E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.27E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	6.61E-10	=	[	6.6E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	5.17E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	7.91E-09	=	[	7.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.22E-07	=	[	8.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.25E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Diethylphthalate	4.66E-09	=	[	4.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1254	1.03E-10	=	[	1.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.86E-07	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.04E-10	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Diethylphthalate	1.77E-07	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1254	5.50E-09	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	6.41E-07	=	[	3.75E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.51E-10	=	[	9.67E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Diethylphthalate	1.94E-07	=	[	3.40E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1254	6.02E-09	=	[	7.54E-03	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.97E-02	x	0.00E+00	=	0.00E+00	2.16E-02	/	1.00E+00	=	2.16E-02
Antimony	6.93E-07	x	0.00E+00	=	0.00E+00	7.58E-07	/	4.00E-04	=	1.90E-03
Arsenic	9.80E-06	x	1.50E+00	=	1.47E-05	1.07E-05	/	3.00E-04	=	3.57E-02
Barium	2.22E-04	x	0.00E+00	=	0.00E+00	2.43E-04	/	2.00E-01	=	1.21E-03
Cadmium	2.53E-07	x	0.00E+00	=	0.00E+00	2.76E-07	/	1.00E-03	=	2.76E-04
Chromium	2.49E-05	x	0.00E+00	=	0.00E+00	2.72E-05	/	3.00E-03	=	9.08E-03
Cobalt	2.38E-05	x	0.00E+00	=	0.00E+00	2.60E-05	/	3.00E-04	=	8.66E-02
Copper	3.33E-05	x	0.00E+00	=	0.00E+00	3.64E-05	/	4.00E-02	=	9.11E-04
Fluoride	5.81E-06	x	0.00E+00	=	0.00E+00	6.36E-06	/	4.00E-02	=	1.59E-04
Iron	6.29E-02	x	0.00E+00	=	0.00E+00	6.88E-02	/	7.00E-01	=	9.83E-02
Lithium	2.18E-05	x	0.00E+00	=	0.00E+00	2.38E-05	/	2.00E-03	=	1.19E-02
Manganese	9.25E-04	x	0.00E+00	=	0.00E+00	1.01E-03	/	1.40E-01	=	7.22E-03
Nickel	2.83E-05	x	0.00E+00	=	0.00E+00	3.10E-05	/	2.00E-02	=	1.55E-03
Nitrate	2.37E-05	x	0.00E+00	=	0.00E+00	2.59E-05	/	7.10E+00	=	3.65E-06
Nitrite	2.42E-06	x	0.00E+00	=	0.00E+00	2.64E-06	/	3.00E-01	=	8.81E-06
Silver	1.26E-07	x	0.00E+00	=	0.00E+00	1.38E-07	/	5.00E-03	=	2.76E-05
Strontium	9.86E-05	x	0.00E+00	=	0.00E+00	1.08E-04	/	6.00E-01	=	1.80E-04
Tin	3.03E-05	x	0.00E+00	=	0.00E+00	3.31E-05	/	6.00E-01	=	5.52E-05
Total Uranium	1.51E-06	x	0.00E+00	=	0.00E+00	1.65E-06	/	3.00E-03	=	5.50E-04
Vanadium	1.57E-04	x	0.00E+00	=	0.00E+00	1.71E-04	/	5.00E-03	=	3.43E-02
Zinc	1.19E-04	x	0.00E+00	=	0.00E+00	1.30E-04	/	3.00E-01	=	4.34E-04
Diethylphthalate	8.88E-07	x	0.00E+00	=	0.00E+00	9.71E-07	/	8.00E-01	=	1.21E-06
Aroclor-1254	1.97E-08	x	2.00E+00	=	3.94E-08	2.15E-08	/	2.00E-05	=	1.08E-03
			Pathway total	=	1.47E-05			Pathway total	=	3.13E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.46E-05	x		=	NA	1.03E-04	/[	5.00E-03	x	1000	]=	2.07E-05
Antimony	3.32E-09	x		=	NA	3.63E-09	/[		x	1000	]=	NA
Arsenic	4.70E-08	x	4.30E-03	=	2.02E-10	5.14E-08	/[	1.50E-05	x	1000	]=	3.43E-06
Barium	1.06E-06	x		=	NA	1.16E-06	/[	5.00E-04	x	1000	]=	2.33E-06
Cadmium	1.21E-09	x	1.80E-03	=	2.18E-12	1.33E-09	/[	1.00E-05	x	1000	]=	1.33E-07
Chromium	1.19E-07	x	8.40E-02	=	1.00E-08	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	1.14E-07	x	9.00E-03	=	1.03E-09	1.25E-07	/[	6.00E-06	x	1000	]=	2.08E-05
Copper	1.60E-07	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	2.79E-08	x		=	NA	3.05E-08	/[	1.30E-02	x	1000	]=	2.34E-09
Iron	3.02E-04	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.04E-07	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	4.43E-06	x		=	NA	4.85E-06	/[	5.00E-05	x	1000	]=	9.70E-05
Nickel	1.36E-07	x	2.60E-04	=	3.53E-11	1.49E-07	/[	9.00E-05	x	1000	]=	1.65E-06
Nitrate	1.14E-07	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Nitrite	1.16E-08	x		=	NA	1.27E-08	/[		x	1000	]=	NA
Silver	6.05E-10	x		=	NA	6.61E-10	/[		x	1000	]=	NA
Strontium	4.73E-07	x		=	NA	5.17E-07	/[		x	1000	]=	NA
Tin	1.45E-07	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Total Uranium	7.23E-09	x		=	NA	7.91E-09	/[	4.00E-05	x	1000	]=	1.98E-07
Vanadium	7.51E-07	x		=	NA	8.22E-07	/[	1.00E-04	x	1000	]=	8.22E-06
Zinc	5.71E-07	x		=	NA	6.25E-07	/[		x	1000	]=	NA
Diethylphthalate	4.26E-09	x		=	NA	4.66E-09	/[		x	1000	]=	NA
Aroclor-1254	9.44E-11	x	5.70E-04	=	5.38E-14	1.03E-10	/[		x	1000	]=	NA
			Pathway total =		1.13E-08					Pathway total =		1.56E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.86E-07	x	1.50E+00	=	8.80E-07	6.41E-07	/	3.00E-04	=	2.14E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	5.04E-10	x		=	NA	5.51E-10	/	2.50E-05	=	2.21E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	1.77E-07	x		=	NA	1.94E-07	/	8.00E-01	=	2.42E-07
Aroclor-1254	5.50E-09	x	2.00E+00	=	1.10E-08	6.02E-09	/	2.00E-05	=	3.01E-04
			Pathway total =		8.91E-07			Pathway total =		2.46E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03
Arsenic	Sum of all pathways	=	1.56E-05	100%	Sum of all pathways	=	3.8E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Cadmium	Sum of all pathways	=	2.18E-12		Sum of all pathways	=	3.0E-04
Chromium	Sum of all pathways	=	1.00E-08		Sum of all pathways	=	9.1E-03
Cobalt	Sum of all pathways	=	1.03E-09		Sum of all pathways	=	8.7E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.1E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	9.8E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	7.3E-03
Nickel	Sum of all pathways	=	3.53E-11		Sum of all pathways	=	1.6E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-06
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	2.8E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	5.5E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.5E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04
Diethylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-06
Aroclor-1254	Sum of all pathways	=	5.04E-08		Sum of all pathways	=	1.4E-03

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.56E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.16E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.48E-02	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	1.88E-06	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.54E-05	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.58E-04	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	1.05E-06	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	3.92E-07	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	3.34E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.87E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	4.73E-05	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	5.98E-06	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	7.47E-02	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	3.16E-05	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.17E-03	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	1.32E-08	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	3.40E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	4.55E-05	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	5.51E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	2.09E-07	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.17E-04	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	2.21E-06	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	2.05E-04	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.33E-04	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.11E-07	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.72E-02	=	[	9.51E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	2.06E-06	=	[	7.21E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	6.06E-05	=	[	2.12E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.82E-04	=	[	9.88E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	1.15E-06	=	[	4.03E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	4.29E-07	=	[	1.50E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	3.66E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	3.14E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	5.17E-05	=	[	1.81E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	6.54E-06	=	[	2.29E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	8.17E-02	=	[	2.86E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	3.46E-05	=	[	1.21E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.28E-03	=	[	4.49E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	1.45E-08	=	[	5.06E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.71E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	4.97E-05	=	[	1.74E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	6.03E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	2.29E-07	=	[	8.00E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.28E-04	=	[	4.47E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	2.42E-06	=	[	8.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	2.24E-04	=	[	7.85E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.46E-04	=	[	5.11E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	2.31E-07	=	[	8.07E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.19E-04	=	[	1.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	9.03E-09	=	[	9.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	2.66E-07	=	[	2.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.24E-06	=	[	1.4E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	5.05E-09	=	[	5.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.88E-09	=	[	2.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.60E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.38E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	2.27E-07	=	[	2.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.87E-08	=	[	3.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.58E-04	=	[	3.9E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.52E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.62E-06	=	[	6.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	6.34E-11	=	[	6.9E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.63E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	2.18E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	2.64E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.00E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	5.60E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.06E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	9.83E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.40E-07	=	[	7.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.01E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.30E-04	=	[	1.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	9.88E-09	=	[	9.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	2.90E-07	=	[	2.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.35E-06	=	[	1.4E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	5.52E-09	=	[	5.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	2.05E-09	=	[	2.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.75E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.48E-07	=	[	2.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.14E-08	=	[	3.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.92E-04	=	[	3.9E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.66E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	6.15E-06	=	[	6.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	6.93E-11	=	[	6.9E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	2.38E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.10E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	6.12E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	1.16E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	7.00E-07	=	[	7.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.11E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	3.31E-06	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.82E-10	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.21E-08	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	3.63E-06	=	[	2.12E+01	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	8.55E-10	=	[	1.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.60E-08	=	[	8.07E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.48E-02	x	0.00E+00	=	0.00E+00	2.72E-02	/	1.00E+00	=	2.72E-02
Antimony	1.88E-06	x	0.00E+00	=	0.00E+00	2.06E-06	/	4.00E-04	=	5.15E-03
Arsenic	5.54E-05	x	1.50E+00	=	8.31E-05	6.06E-05	/	3.00E-04	=	2.02E-01
Barium	2.58E-04	x	0.00E+00	=	0.00E+00	2.82E-04	/	2.00E-01	=	1.41E-03
Beryllium	1.05E-06	x	0.00E+00	=	0.00E+00	1.15E-06	/	2.00E-03	=	5.76E-04
Cadmium	3.92E-07	x	0.00E+00	=	0.00E+00	4.29E-07	/	1.00E-03	=	4.29E-04
Chromium	3.34E-05	x	0.00E+00	=	0.00E+00	3.66E-05	/	3.00E-03	=	1.22E-02
Cobalt	2.87E-05	x	0.00E+00	=	0.00E+00	3.14E-05	/	3.00E-04	=	1.05E-01
Copper	4.73E-05	x	0.00E+00	=	0.00E+00	5.17E-05	/	4.00E-02	=	1.29E-03
Fluoride	5.98E-06	x	0.00E+00	=	0.00E+00	6.54E-06	/	4.00E-02	=	1.64E-04
Iron	7.47E-02	x	0.00E+00	=	0.00E+00	8.17E-02	/	7.00E-01	=	1.17E-01
Lithium	3.16E-05	x	0.00E+00	=	0.00E+00	3.46E-05	/	2.00E-03	=	1.73E-02
Manganese	1.17E-03	x	0.00E+00	=	0.00E+00	1.28E-03	/	1.40E-01	=	9.16E-03
Mercury	1.32E-08	x	0.00E+00	=	0.00E+00	1.45E-08	/	0.00E+00	=	NA
Nickel	3.40E-05	x	0.00E+00	=	0.00E+00	3.71E-05	/	2.00E-02	=	1.86E-03
Nitrate	4.55E-05	x	0.00E+00	=	0.00E+00	4.97E-05	/	7.10E+00	=	7.00E-06
Nitrite	5.51E-06	x	0.00E+00	=	0.00E+00	6.03E-06	/	3.00E-01	=	2.01E-05
Silver	2.09E-07	x	0.00E+00	=	0.00E+00	2.29E-07	/	5.00E-03	=	4.57E-05
Strontium	1.17E-04	x	0.00E+00	=	0.00E+00	1.28E-04	/	6.00E-01	=	2.13E-04
Total Uranium	2.21E-06	x	0.00E+00	=	0.00E+00	2.42E-06	/	3.00E-03	=	8.05E-04
Vanadium	2.05E-04	x	0.00E+00	=	0.00E+00	2.24E-04	/	5.00E-03	=	4.49E-02
Zinc	1.33E-04	x	0.00E+00		0.00E+00	1.46E-04	/	3.00E-01	=	4.87E-04
Butylbenzylphthalate	2.11E-07	x	1.90E-03	=	4.01E-10	2.31E-07	/	2.00E-01	=	1.15E-06
			Pathway total	=	8.31E-05			Pathway total	=	5.47E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.19E-04	x		=	NA	1.30E-04	/[	5.00E-03	x	1000	]=	2.61E-05
Antimony	9.03E-09	x		=	NA	9.88E-09	/[		x	1000	]=	NA
Arsenic	2.66E-07	x	4.30E-03	=	1.14E-09	2.90E-07	/[	1.50E-05	x	1000	]=	1.94E-05
Barium	1.24E-06	x		=	NA	1.35E-06	/[	5.00E-04	x	1000	]=	2.71E-06
Beryllium	5.05E-09	x	2.40E-03	=	1.21E-11	5.52E-09	/[	2.00E-05	x	1000	]=	2.76E-07
Cadmium	1.88E-09	x	1.80E-03	=	3.38E-12	2.05E-09	/[	1.00E-05	x	1000	]=	2.05E-07
Chromium	1.60E-07	x	8.40E-02	=	1.35E-08	1.75E-07	/[	1.00E-04	x	1000	]=	1.75E-06
Cobalt	1.38E-07	x	9.00E-03	=	1.24E-09	1.51E-07	/[	6.00E-06	x	1000	]=	2.51E-05
Copper	2.27E-07	x		=	NA	2.48E-07	/[		x	1000	]=	NA
Fluoride	2.87E-08	x		=	NA	3.14E-08	/[	1.30E-02	x	1000	]=	2.41E-09
Iron	3.58E-04	x		=	NA	3.92E-04	/[		x	1000	]=	NA
Lithium	1.52E-07	x		=	NA	1.66E-07	/[		x	1000	]=	NA
Manganese	5.62E-06	x		=	NA	6.15E-06	/[	5.00E-05	x	1000	]=	1.23E-04
Mercury	6.34E-11	x	0.00E+00	=	0.00E+00	6.93E-11	/[	3.00E-04	x	1000	]=	2.31E-10
Nickel	1.63E-07	x	2.60E-04	=	4.23E-11	1.78E-07	/[	9.00E-05	x	1000	]=	1.98E-06
Nitrate	2.18E-07	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Nitrite	2.64E-08	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Silver	1.00E-09	x		=	NA	1.10E-09	/[		x	1000	]=	NA
Strontium	5.60E-07	x		=	NA	6.12E-07	/[		x	1000	]=	NA
Total Uranium	1.06E-08	x		=	NA	1.16E-08	/[	4.00E-05	x	1000	]=	2.90E-07
Vanadium	9.83E-07	x		=	NA	1.08E-06	/[	1.00E-04	x	1000	]=	1.08E-05
Zinc	6.40E-07	x				7.00E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	1.01E-09	x	0.00E+00	=	0.00E+00	1.11E-09	/[		x	1000	]=	NA
			Pathway total =		1.59E-08					Pathway total =		2.12E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.31E-06	x	1.50E+00	=	4.97E-06	3.63E-06	/	3.00E-04	=	1.21E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.82E-10	x		=	NA	8.55E-10	/	2.50E-05	=	3.42E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	4.21E-08	x	1.90E-03	=	7.99E-11	4.60E-08	/	2.00E-01	=	2.30E-07
			Pathway total =		4.97E-06			Pathway total =		1.21E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.7E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	5.2E-03
Arsenic	Sum of all pathways	=	**8.80E-05**	100%	Sum of all pathways	=	2.1E-01
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03
Beryllium	Sum of all pathways	=	1.21E-11		Sum of all pathways	=	5.8E-04
Cadmium	Sum of all pathways	=	3.38E-12		Sum of all pathways	=	4.6E-04
Chromium	Sum of all pathways	=	1.35E-08		Sum of all pathways	=	1.2E-02
Cobalt	Sum of all pathways	=	1.24E-09		Sum of all pathways	=	1.0E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-10
Nickel	Sum of all pathways	=	4.23E-11		Sum of all pathways	=	1.9E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	7.0E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.6E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	8.1E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.9E-04
Butylbenzylphthalate	Sum of all pathways	=	4.80E-10		Sum of all pathways	=	1.4E-06

Total Carcinogenic Risk All Pathways and Chemicals	=	**8.81E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	5.59E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.94E-02	=	[	7.42E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	4.65E-07	=	[	1.78E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.36E-05	=	[	5.20E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.05E-04	=	[	7.84E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	4.15E-07	=	[	1.59E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	8.72E-06	=	[	3.34E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	8.52E-06	=	[	3.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	4.49E-05	=	[	1.72E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.30E-05	=	[	8.82E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	4.31E-05	=	[	1.65E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	3.87E-06	=	[	1.48E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.32E-02	=	[	2.42E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.38E-05	=	[	9.13E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.29E-03	=	[	4.95E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	6.06E-08	=	[	2.32E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	3.24E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	1.31E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	3.66E-06	=	[	1.40E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	1.46E-06	=	[	5.60E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	2.22E-07	=	[	8.50E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	9.06E-05	=	[	3.47E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	2.16E-06	=	[	8.27E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.54E-04	=	[	5.88E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.17E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	1.73E-08	=	[	6.63E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.24E-07	=	[	1.24E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	8.80E-10	=	[	3.37E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aldrin	5.22E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.12E-02	=	[	7.42E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	5.09E-07	=	[	1.78E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.49E-05	=	[	5.20E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.24E-04	=	[	7.84E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	4.54E-07	=	[	1.59E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	9.54E-06	=	[	3.34E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	9.31E-06	=	[	3.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	4.91E-05	=	[	1.72E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.52E-05	=	[	8.82E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	4.71E-05	=	[	1.65E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	4.23E-06	=	[	1.48E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.91E-02	=	[	2.42E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.61E-05	=	[	9.13E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.41E-03	=	[	4.95E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	6.63E-08	=	[	2.32E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.54E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	1.43E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	4.00E-06	=	[	1.40E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	1.60E-06	=	[	5.60E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	2.43E-07	=	[	8.50E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	9.91E-05	=	[	3.47E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	2.36E-06	=	[	8.27E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.68E-04	=	[	5.88E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.28E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	1.89E-08	=	[	6.63E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.54E-07	=	[	1.24E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	9.63E-10	=	[	3.37E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aldrin	5.71E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.29E-05	=	[	1.0E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.23E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.51E-08	=	[	7.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	9.82E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	1.99E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	4.18E-08	=	[	4.6E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	4.08E-08	=	[	4.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	2.15E-07	=	[	2.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.10E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	2.07E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.85E-08	=	[	2.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.03E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.14E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	6.20E-06	=	[	6.8E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.91E-10	=	[	3.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.55E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	6.29E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.75E-08	=	[	1.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	7.01E-09	=	[	7.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.06E-09	=	[	1.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.35E-07	=	[	4.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.04E-08	=	[	1.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.36E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.61E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	8.30E-11	=	[	9.1E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.55E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	4.22E-12	=	[	4.6E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aldrin	2.50E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	1.02E-04	=	[1.0E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	2.44E-09	=	[2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	7.12E-08	=	[7.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.07E-06	=	[1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.18E-09	=	[2.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	4.58E-08	=	[4.6E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	4.47E-08	=	[4.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	2.36E-07	=	[2.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.21E-07	=	[1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.26E-07	=	[2.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.03E-08	=	[2.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.32E-04	=	[3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.25E-07	=	[1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	6.78E-06	=	[6.8E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	3.18E-10	=	[3.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.70E-07	=	[1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	6.88E-08	=	[6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.92E-08	=	[1.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	7.67E-09	=	[7.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.16E-09	=	[1.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.75E-07	=	[4.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	1.13E-08	=	[1.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.05E-07	=	[8.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.14E-07	=	[6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	9.08E-11	=	[9.1E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.70E-09	=	[1.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	4.62E-12	=	[4.6E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aldrin	2.74E-11	=	[2.7E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	8.13E-07	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.70E-08	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	6.46E-08	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aldrin	1.04E-09	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.89E-07	=	[	5.20E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.86E-08	=	[	3.26E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	7.07E-08	=	[	1.24E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aldrin	1.14E-09	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.94E-02	x	0.00E+00	=	0.00E+00	2.12E-02	/	1.00E+00	=	2.12E-02
Antimony	4.65E-07	x	0.00E+00	=	0.00E+00	5.09E-07	/	4.00E-04	=	1.27E-03
Arsenic	1.36E-05	x	1.50E+00	=	2.04E-05	1.49E-05	/	3.00E-04	=	4.95E-02
Barium	2.05E-04	x	0.00E+00	=	0.00E+00	2.24E-04	/	2.00E-01	=	1.12E-03
Beryllium	4.15E-07	x	0.00E+00	=	0.00E+00	4.54E-07	/	2.00E-03	=	2.27E-04
Boron	8.72E-06	x	0.00E+00	=	0.00E+00	9.54E-06	/	2.00E-01	=	4.77E-05
Cadmium	8.52E-06	x	0.00E+00	=	0.00E+00	9.31E-06	/	1.00E-03	=	9.31E-03
Chromium	4.49E-05	x	0.00E+00	=	0.00E+00	4.91E-05	/	3.00E-03	=	1.64E-02
Cobalt	2.30E-05	x	0.00E+00	=	0.00E+00	2.52E-05	/	3.00E-04	=	8.40E-02
Copper	4.31E-05	x	0.00E+00	=	0.00E+00	4.71E-05	/	4.00E-02	=	1.18E-03
Fluoride	3.87E-06	x	0.00E+00	=	0.00E+00	4.23E-06	/	4.00E-02	=	1.06E-04
Iron	6.32E-02	x	0.00E+00	=	0.00E+00	6.91E-02	/	7.00E-01	=	9.88E-02
Lithium	2.38E-05	x	0.00E+00	=	0.00E+00	2.61E-05	/	2.00E-03	=	1.30E-02
Manganese	1.29E-03	x	0.00E+00	=	0.00E+00	1.41E-03	/	1.40E-01	=	1.01E-02
Mercury	6.06E-08	x	0.00E+00	=	0.00E+00	6.63E-08	/	0.00E+00	=	NA
Nickel	3.24E-05	x	0.00E+00	=	0.00E+00	3.54E-05	/	2.00E-02	=	1.77E-03
Nitrate	1.31E-05	x	0.00E+00	=	0.00E+00	1.43E-05	/	7.10E+00	=	2.02E-06
Nitrite	3.66E-06	x	0.00E+00	=	0.00E+00	4.00E-06	/	3.00E-01	=	1.33E-05
Selenium	1.46E-06	x	0.00E+00	=	0.00E+00	1.60E-06	/	5.00E-03	=	3.20E-04
Silver	2.22E-07	x	0.00E+00	=	0.00E+00	2.43E-07	/	5.00E-03	=	4.86E-05
Strontium	9.06E-05	x	0.00E+00	=	0.00E+00	9.91E-05	/	6.00E-01	=	1.65E-04
Total Uranium	2.16E-06	x	0.00E+00	=	0.00E+00	2.36E-06	/	3.00E-03	=	7.88E-04
Vanadium	1.54E-04	x	0.00E+00	=	0.00E+00	1.68E-04	/	5.00E-03	=	3.36E-02
Zinc	1.17E-04	x	0.00E+00	=	0.00E+00	1.28E-04	/	3.00E-01	=	4.27E-04
Acetone	1.73E-08	x	0.00E+00	=	0.00E+00	1.89E-08	/	9.00E-01	=	2.10E-08
Butylbenzylphthalate	3.24E-07	x	1.90E-03	=	6.15E-10	3.54E-07	/	2.00E-01	=	1.77E-06
Toluene	8.80E-10	x	0.00E+00	=	0.00E+00	9.63E-10	/	8.00E-02	=	1.20E-08
Aldrin	5.22E-09	x	1.70E+01	=	8.88E-08	5.71E-09	/	3.00E-05	=	1.90E-04
			Pathway total	=	2.05E-05			Pathway total	=	3.44E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.29E-05	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	2.23E-09	x		=	NA	2.44E-09	/[		x	1000	]=	NA
Arsenic	6.51E-08	x	4.30E-03	=	2.80E-10	7.12E-08	/[	1.50E-05	x	1000	]=	4.75E-06
Barium	9.82E-07	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.15E-06
Beryllium	1.99E-09	x	2.40E-03	=	4.78E-12	2.18E-09	/[	2.00E-05	x	1000	]=	1.09E-07
Boron	4.18E-08	x	0.00E+00	=	0.00E+00	4.58E-08	/[	2.00E-02	x	1000	]=	2.29E-09
Cadmium	4.08E-08	x	1.80E-03	=	7.35E-11	4.47E-08	/[	1.00E-05	x	1001	]=	4.46E-06
Chromium	2.15E-07	x	8.40E-02	=	1.81E-08	2.36E-07	/[	1.00E-04	x	1002	]=	2.35E-06
Cobalt	1.10E-07	x	9.00E-03	=	9.94E-10	1.21E-07	/[	6.00E-06	x	1003	]=	2.01E-05
Copper	2.07E-07	x		=	NA	2.26E-07	/[		x	1004	]=	NA
Fluoride	1.85E-08	x		=	NA	2.03E-08	/[	1.30E-02	x	1005	]=	1.55E-09
Iron	3.03E-04	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	1.14E-07	x		=	NA	1.25E-07	/[		x	1000	]=	NA
Manganese	6.20E-06	x		=	NA	6.78E-06	/[	5.00E-05	x	1000	]=	1.36E-04
Mercury	2.91E-10	x	0.00E+00	=	0.00E+00	3.18E-10	/[	3.00E-04	x	1000	]=	1.06E-09
Nickel	1.55E-07	x	2.60E-04	=	4.04E-11	1.70E-07	/[	9.00E-05	x	1000	]=	1.89E-06
Nitrate	6.29E-08	x		=	NA	6.88E-08	/[		x	1000	]=	NA
Nitrite	1.75E-08	x		=	NA	1.92E-08	/[		x	1000	]=	NA
Selenium	7.01E-09	x	0.00E+00	=	0.00E+00	7.67E-09	/[	2.00E-02	x	1000	]=	3.84E-10
Silver	1.06E-09	x		=	NA	1.16E-09	/[		x	1000	]=	NA
Strontium	4.35E-07	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Total Uranium	1.04E-08	x		=	NA	1.13E-08	/[	4.00E-05	x	1000	]=	2.83E-07
Vanadium	7.36E-07	x		=	NA	8.05E-07	/[	1.00E-04	x	1000	]=	8.05E-06
Zinc	5.61E-07	x		=	NA	6.14E-07	/[		x	1000	]=	NA
Acetone	8.30E-11	x	0.00E+00	=	0.00E+00	9.08E-11	/[	3.10E+01	x	1000	]=	2.93E-15
Butylbenzylphthalate	1.55E-09	x	0.00E+00	=	0.00E+00	1.70E-09	/[		x	1000	]=	NA
Toluene	4.22E-12	x	0.00E+00	=	0.00E+00	4.62E-12	/[	5.00E+00	x	1000	]=	9.23E-16
Aldrin	2.50E-11	x	4.90E-03	=	1.23E-13	2.74E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.95E-08					Pathway total =		2.00E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	8.13E-07	x	1.50E+00	=	1.22E-06	8.89E-07	/	3.00E-04	=	2.96E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	1.70E-08	x		=	NA	1.86E-08	/	2.50E-05	=	7.43E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	6.46E-08	x	1.90E-03	=	1.23E-10	7.07E-08	/	2.00E-01	=	3.53E-07
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	1.04E-09	x	1.70E+01	=	1.77E-08	1.14E-09	/	3.00E-05	=	3.80E-05
			Pathway total =		1.24E-06			Pathway total =		3.75E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Arsenic	Sum of all pathways	=	2.16E-05	99%	Sum of all pathways	=	5.2E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Beryllium	Sum of all pathways	=	4.78E-12		Sum of all pathways	=	2.3E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	4.8E-05
Cadmium	Sum of all pathways	=	7.35E-11		Sum of all pathways	=	1.0E-02
Chromium	Sum of all pathways	=	1.81E-08		Sum of all pathways	=	1.6E-02
Cobalt	Sum of all pathways	=	9.94E-10		Sum of all pathways	=	8.4E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	9.9E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-09
Nickel	Sum of all pathways	=	4.04E-11		Sum of all pathways	=	1.8E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	3.2E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.9E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	7.9E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-08
Butylbenzylphthalate	Sum of all pathways	=	7.38E-10		Sum of all pathways	=	2.1E-06
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-08
Aldrin	Sum of all pathways	=	1.07E-07		Sum of all pathways	=	2.3E-04

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**2.17E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.48E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.77E-02	=	[	6.76E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	6.46E-07	=	[	2.47E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	9.11E-06	=	[	3.49E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.46E-04	=	[	9.41E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	7.78E-07	=	[	2.98E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	3.04E-07	=	[	1.17E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	2.35E-05	=	[	8.98E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.14E-05	=	[	8.18E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.40E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	5.52E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.26E-02	=	[	2.39E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	1.94E-05	=	[	7.43E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.01E-03	=	[	3.86E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	7.94E-08	=	[	3.04E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	2.94E-05	=	[	1.13E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	1.87E-05	=	[	7.15E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	7.99E-06	=	[	3.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	2.14E-07	=	[	8.18E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	9.45E-05	=	[	3.62E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	1.66E-05	=	[	6.36E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.87E-06	=	[	7.15E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.82E-04	=	[	6.97E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.00E-04	=	[	3.83E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
2-Butanone	6.49E-09	=	[	2.48E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.05E-05	=	[	4.03E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.55E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	9.38E-08	=	[	3.59E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	5.22E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
o-Xylene	3.34E-10	=	[	1.28E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	1.71E-09	=	[	6.54E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	2.55E-09	=	[	9.78E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Xylenes (total)	1.21E-09	=	[	4.63E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	6.59E-08	=	[	2.52E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.33E-08	=	[	5.10E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	5.38E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.93E-02	=	[	6.76E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	7.06E-07	=	[	2.47E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	9.96E-06	=	[	3.49E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.69E-04	=	[	9.41E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	8.51E-07	=	[	2.98E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	3.33E-07	=	[	1.17E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	2.56E-05	=	[	8.98E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.34E-05	=	[	8.18E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.72E-05	=	[	1.30E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	6.03E-06	=	[	2.11E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.84E-02	=	[	2.39E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.12E-05	=	[	7.43E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.10E-03	=	[	3.86E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	8.69E-08	=	[	3.04E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.22E-05	=	[	1.13E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.04E-05	=	[	7.15E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	8.74E-06	=	[	3.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	2.34E-07	=	[	8.18E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.03E-04	=	[	3.62E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	1.82E-05	=	[	6.36E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	2.04E-06	=	[	7.15E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.99E-04	=	[	6.97E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.10E-04	=	[	3.83E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
2-Butanone	7.10E-09	=	[	2.48E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.15E-05	=	[	4.03E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	1.69E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	1.03E-07	=	[	3.59E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	5.71E-09	=	[	2.00E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
o-Xylene	3.66E-10	=	[	1.28E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	1.87E-09	=	[	6.54E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	2.79E-09	=	[	9.78E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Xylenes (total)	1.32E-09	=	[	4.63E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	7.21E-08	=	[	2.52E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Gamma-BHC (Lindane)	1.46E-08	=	[	5.10E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	5.89E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.47E-05	=	[	9.3E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.10E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.37E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.18E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	3.73E-09	=	[	4.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.46E-09	=	[	1.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.12E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.02E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.63E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.65E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.00E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	9.30E-08	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.84E-06	=	[	5.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	3.81E-10	=	[	4.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.41E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	8.96E-08	=	[	9.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.83E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.02E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.53E-07	=	[	5.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	7.97E-08	=	[	8.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.96E-09	=	[	9.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.73E-07	=	[	9.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	4.80E-07	=	[	5.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
2-Butanone	3.11E-11	=	[	3.4E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	5.05E-08	=	[	5.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.42E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Hexane	4.50E-10	=	[	4.9E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	2.50E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
o-Xylene	1.60E-12	=	[	1.8E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	8.19E-12	=	[	9.0E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	1.22E-11	=	[	1.3E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.80E-12	=	[	6.3E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	3.16E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	6.39E-11	=	[	7.0E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.58E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.26E-05	=	[	9.3E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.39E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	4.78E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.29E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	4.08E-09	=	[	4.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.60E-09	=	[	1.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.23E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.12E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.28E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.02E-07	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.29E-06	=	[	5.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	4.16E-10	=	[	4.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.54E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	9.80E-08	=	[	9.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	4.19E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.12E-09	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.96E-07	=	[	5.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	8.71E-08	=	[	8.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.80E-09	=	[	9.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	9.55E-07	=	[	9.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	5.25E-07	=	[	5.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
2-Butanone	3.40E-11	=	[	3.4E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	5.52E-08	=	[	5.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Hexane	4.92E-10	=	[	4.9E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
o-Xylene	1.75E-12	=	[	1.8E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	8.96E-12	=	[	9.0E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	1.34E-11	=	[	1.3E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Xylenes (total)	6.34E-12	=	[	6.3E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.46E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Gamma-BHC (Lindane)	6.99E-11	=	[	7.0E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1260	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.45E-07	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.07E-10	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	2.10E-06	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.32E-08	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Gamma-BHC (Lindane)	1.06E-09	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.50E-08	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	5.96E-07	=	[	3.49E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.64E-10	=	[	1.17E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	2.30E-06	=	[	4.03E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.38E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.44E-08	=	[	2.52E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Gamma-BHC (Lindane)	1.16E-09	=	[	5.10E-03	x	1.00E-06	x	5,700	x	0.07	x	0.04	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	1.64E-08	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.77E-02	x	0.00E+00	=	0.00E+00	1.93E-02	/	1.00E+00	=	1.93E-02
Antimony	6.46E-07	x	0.00E+00	=	0.00E+00	7.06E-07	/	4.00E-04	=	1.77E-03
Arsenic	9.11E-06	x	1.50E+00	=	1.37E-05	9.96E-06	/	3.00E-04	=	3.32E-02
Barium	2.46E-04	x	0.00E+00	=	0.00E+00	2.69E-04	/	2.00E-01	=	1.34E-03
Beryllium	7.78E-07	x	0.00E+00	=	0.00E+00	8.51E-07	/	2.00E-03	=	4.26E-04
Cadmium	3.04E-07	x	0.00E+00	=	0.00E+00	3.33E-07	/	1.00E-03	=	3.33E-04
Chromium	2.35E-05	x	0.00E+00	=	0.00E+00	2.56E-05	/	3.00E-03	=	8.55E-03
Cobalt	2.14E-05	x	0.00E+00	=	0.00E+00	2.34E-05	/	3.00E-04	=	7.79E-02
Copper	3.40E-05	x	0.00E+00	=	0.00E+00	3.72E-05	/	4.00E-02	=	9.31E-04
Fluoride	5.52E-06	x	0.00E+00	=	0.00E+00	6.03E-06	/	4.00E-02	=	1.51E-04
Iron	6.26E-02	x	0.00E+00	=	0.00E+00	6.84E-02	/	7.00E-01	=	9.77E-02
Lithium	1.94E-05	x	0.00E+00	=	0.00E+00	2.12E-05	/	2.00E-03	=	1.06E-02
Manganese	1.01E-03	x	0.00E+00	=	0.00E+00	1.10E-03	/	1.40E-01	=	7.88E-03
Mercury	7.94E-08	x	0.00E+00	=	0.00E+00	8.69E-08	/	0.00E+00	=	NA
Nickel	2.94E-05	x	0.00E+00	=	0.00E+00	3.22E-05	/	2.00E-02	=	1.61E-03
Nitrate	1.87E-05	x	0.00E+00	=	0.00E+00	2.04E-05	/	7.10E+00	=	2.88E-06
Nitrite	7.99E-06	x	0.00E+00	=	0.00E+00	8.74E-06	/	3.00E-01	=	2.91E-05
Silver	2.14E-07	x	0.00E+00	=	0.00E+00	2.34E-07	/	5.00E-03	=	4.67E-05
Strontium	9.45E-05	x	0.00E+00	=	0.00E+00	1.03E-04	/	6.00E-01	=	1.72E-04
Tin	1.66E-05	x	0.00E+00	=	0.00E+00	1.82E-05	/	6.00E-01	=	3.03E-05
Total Uranium	1.87E-06	x	0.00E+00	=	0.00E+00	2.04E-06	/	3.00E-03	=	6.81E-04
Vanadium	1.82E-04	x	0.00E+00	=	0.00E+00	1.99E-04	/	5.00E-03	=	3.99E-02
Zinc	1.00E-04	x	0.00E+00	=	0.00E+00	1.10E-04	/	3.00E-01	=	3.65E-04
2-Butanone	6.49E-09	x	0.00E+00	=	0.00E+00	7.10E-09	/	6.00E-01	=	1.18E-08
Bis(2-ethylhexyl) phthalate	1.05E-05	x	1.40E-02	=	1.47E-07	1.15E-05	/	2.00E-02	=	5.76E-04
Butylbenzylphthalate	1.55E-07	x	1.90E-03	=	2.94E-10	1.69E-07	/	2.00E-01	=	8.46E-07
Hexane	9.38E-08	x	0.00E+00	=	0.00E+00	1.03E-07	/	6.00E-02	=	1.71E-06
Methylene chloride	5.22E-09	x	2.00E-03	=	1.04E-11	5.71E-09	/	6.00E-03	=	9.52E-07
o-Xylene	3.34E-10	x	0.00E+00	=	0.00E+00	3.66E-10	/	2.00E-01	=	1.83E-09
Styrene	1.71E-09	x	0.00E+00	=	0.00E+00	1.87E-09	/	2.00E-01	=	9.34E-09
Toluene	2.55E-09	x	0.00E+00	=	0.00E+00	2.79E-09	/	8.00E-02	=	3.49E-08
Xylenes (total)	1.21E-09	x	0.00E+00	=	0.00E+00	1.32E-09	/	2.00E-01	=	6.61E-09
beta-BHC	6.59E-08	x	1.80E+00	=	1.19E-07	7.21E-08	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	1.33E-08	x	1.10E+00	=	1.47E-08	1.46E-08	/	3.00E-04	=	4.86E-05
Aroclor-1260	5.38E-08	x	2.00E+00	=	1.08E-07	5.89E-08	/	0.00E+00	=	NA
			Pathway total	=	1.41E-05			Pathway total	=	3.04E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.47E-05	x		=	NA	9.26E-05	/[	5.00E-03	x	1000	]=	1.85E-05
Antimony	3.10E-09	x		=	NA	3.39E-09	/[		x	1000	]=	NA
Arsenic	4.37E-08	x	4.30E-03	=	1.88E-10	4.78E-08	/[	1.50E-05	x	1000	]=	3.19E-06
Barium	1.18E-06	x		=	NA	1.29E-06	/[	5.00E-04	x	1000	]=	2.58E-06
Beryllium	3.73E-09	x	2.40E-03	=	8.96E-12	4.08E-09	/[	2.00E-05	x	1000	]=	2.04E-07
Cadmium	1.46E-09	x	1.80E-03	=	2.63E-12	1.60E-09	/[	1.00E-05	x	1000	]=	1.60E-07
Chromium	1.12E-07	x	8.40E-02	=	9.44E-09	1.23E-07	/[	1.00E-04	x	1000	]=	1.23E-06
Cobalt	1.02E-07	x	9.00E-03	=	9.22E-10	1.12E-07	/[	6.00E-06	x	1000	]=	1.87E-05
Copper	1.63E-07	x		=	NA	1.78E-07	/[		x	1000	]=	NA
Fluoride	2.65E-08	x		=	NA	2.89E-08	/[	1.30E-02	x	1000	]=	2.23E-09
Iron	3.00E-04	x		=	NA	3.28E-04	/[		x	1000	]=	NA
Lithium	9.30E-08	x		=	NA	1.02E-07	/[		x	1000	]=	NA
Manganese	4.84E-06	x		=	NA	5.29E-06	/[	5.00E-05	x	1000	]=	1.06E-04
Mercury	3.81E-10	x	0.00E+00	=	0.00E+00	4.16E-10	/[	3.00E-04	x	1000	]=	1.39E-09
Nickel	1.41E-07	x	2.60E-04	=	3.66E-11	1.54E-07	/[	9.00E-05	x	1000	]=	1.71E-06
Nitrate	8.96E-08	x		=	NA	9.80E-08	/[		x	1000	]=	NA
Nitrite	3.83E-08	x		=	NA	4.19E-08	/[		x	1000	]=	NA
Silver	1.02E-09	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	4.53E-07	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	7.97E-08	x		=	NA	8.71E-08	/[		x	1000	]=	NA
Total Uranium	8.96E-09	x		=	NA	9.80E-09	/[	4.00E-05	x	1000	]=	2.45E-07
Vanadium	8.73E-07	x		=	NA	9.55E-07	/[	1.00E-04	x	1000	]=	9.55E-06
Zinc	4.80E-07	x		=	NA	5.25E-07	/[		x	1000	]=	NA
2-Butanone	3.11E-11	x	0.00E+00	=	0.00E+00	3.40E-11	/[	5.00E+00	x	1000	]=	6.81E-15
Bis(2-ethylhexyl) phthalate	5.05E-08	x	2.40E-06	=	1.21E-13	5.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	7.42E-10	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	4.50E-10	x	0.00E+00	=	0.00E+00	4.92E-10	/[	7.00E-01	x	1000	]=	7.03E-13
Methylene chloride	2.50E-11	x	1.00E-08	=	2.50E-19	2.74E-11	/[	6.00E-01	x	1000	]=	4.57E-14
o-Xylene	1.60E-12	x	0.00E+00	=	0.00E+00	1.75E-12	/[	1.00E-01	x	1000	]=	1.75E-14
Styrene	8.19E-12	x	0.00E+00	=	0.00E+00	8.96E-12	/[	1.00E+00	x	1000	]=	8.96E-15
Toluene	1.22E-11	x	0.00E+00	=	0.00E+00	1.34E-11	/[	5.00E+00	x	1000	]=	2.68E-15
Xylenes (total)	5.80E-12	x	0.00E+00	=	0.00E+00	6.34E-12	/[	1.00E-01	x	1000	]=	6.34E-14
beta-BHC	3.16E-10	x	5.30E-04	=	1.68E-13	3.46E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	6.39E-11	x	3.10E-04	=	1.98E-14	6.99E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.58E-10	x	5.70E-04	=	1.47E-13	2.82E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.06E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.45E-07	x	1.50E+00	=	8.18E-07	5.96E-07	/	3.00E-04	=	1.99E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	6.07E-10	x		=	NA	6.64E-10	/	2.50E-05	=	2.66E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	0.00E+00	/	3.00E-01	=	0.00E+00
Silver	NA	x		=	NA	6.64E-10	/	2.00E-04	=	3.32E-06
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	NA	/	3.00E-03	=	NA
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	2.10E-06	x	1.40E-02	=	2.94E-08	2.30E-06	/	2.00E-02	=	1.15E-04
Butylbenzylphthalate	3.09E-08	x	1.90E-03	=	5.86E-11	3.38E-08	/	2.00E-01	=	1.69E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
beta-BHC	1.32E-08	x	1.80E+00	=	2.37E-08	1.44E-08	/		=	NA
Gamma-BHC (Lindane)	1.06E-09	x	1.10E+00	=	1.17E-09	1.16E-09	/	3.00E-04	=	3.88E-06
Aroclor-1260	1.50E-08	x	2.00E+00	=	3.01E-08	1.64E-08	/		=	NA
			Pathway total =		9.02E-07			Pathway total =		2.14E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03
Arsenic	Sum of all pathways	=	1.45E-05	97%	Sum of all pathways	=	3.5E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Beryllium	Sum of all pathways	=	8.96E-12	0%	Sum of all pathways	=	4.3E-04
Cadmium	Sum of all pathways	=	2.63E-12	0%	Sum of all pathways	=	3.6E-04
Chromium	Sum of all pathways	=	9.44E-09	0%	Sum of all pathways	=	8.6E-03
Cobalt	Sum of all pathways	=	9.22E-10	0%	Sum of all pathways	=	7.8E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	9.8E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	8.0E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-09
Nickel	Sum of all pathways	=	3.66E-11	0%	Sum of all pathways	=	1.6E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	5.0E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	6.8E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-04
2-Butanone	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.77E-07	1%	Sum of all pathways	=	6.9E-04
Butylbenzylphthalate	Sum of all pathways	=	3.53E-10	0%	Sum of all pathways	=	1.0E-06
Hexane	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-06
Methylene chloride	Sum of all pathways	=	1.04E-11	0%	Sum of all pathways	=	9.5E-07
o-Xylene	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-09
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-09
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-08
Xylenes (total)	Sum of all pathways	=	NA		Sum of all pathways	=	6.6E-09
beta-BHC	Sum of all pathways	=	1.42E-07	1%	Sum of all pathways	=	NA
Gamma-BHC (Lindane)	Sum of all pathways	=	1.58E-08	0%	Sum of all pathways	=	5.2E-05
Aroclor-1260	Sum of all pathways	=	1.38E-07	1%	Sum of all pathways	=	NA

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.50E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.06E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.83E-02	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	6.68E-07	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.31E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.36E-04	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	5.19E-07	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	3.59E-07	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	4.39E-05	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.66E-05	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.19E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	4.33E-06	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.82E-02	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	1.98E-05	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.07E-03	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	5.22E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	3.42E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	8.47E-05	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	3.39E-06	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	2.57E-06	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	1.71E-07	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	8.72E-05	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.42E-06	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.73E-04	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.17E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.22E-07	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	1.49E-06	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	1.03E-09	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	1.61E-09	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.00E-02	=	[	7.01E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	7.31E-07	=	[	2.56E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.43E-05	=	[	5.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.58E-04	=	[	9.05E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	5.68E-07	=	[	1.99E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	3.93E-07	=	[	1.37E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	4.80E-05	=	[	1.68E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.91E-05	=	[	1.02E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.48E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	4.73E-06	=	[	1.66E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	7.45E-02	=	[	2.61E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.16E-05	=	[	7.56E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.17E-03	=	[	4.08E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	5.71E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.74E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	9.27E-05	=	[	3.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	3.71E-06	=	[	1.30E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	2.81E-06	=	[	9.83E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	1.87E-07	=	[	6.55E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	9.54E-05	=	[	3.34E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.56E-06	=	[	5.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.89E-04	=	[	6.61E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.28E-04	=	[	4.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	5.71E-07	=	[	2.00E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	1.63E-06	=	[	5.70E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	1.13E-09	=	[	3.94E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	1.77E-09	=	[	6.18E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.77E-05	=	[	9.6E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.20E-09	=	[	3.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.29E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.13E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.49E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.72E-09	=	[	1.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	2.10E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.28E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.53E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.08E-08	=	[	2.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.27E-04	=	[	3.6E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	9.47E-08	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.11E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	2.50E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.64E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	4.06E-07	=	[	4.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	1.63E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	1.23E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	8.20E-10	=	[	9.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.18E-07	=	[	4.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	6.83E-09	=	[	7.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.28E-07	=	[	9.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.61E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.50E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	7.14E-09	=	[	7.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	4.93E-12	=	[	5.4E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	7.74E-12	=	[	8.5E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	9.60E-05	=	[	9.6E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.50E-09	=	[	3.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.24E-06	=	[	1.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.72E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.88E-09	=	[	1.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	2.30E-07	=	[	2.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.39E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.27E-08	=	[	2.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.57E-04	=	[	3.6E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.04E-07	=	[	1.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.59E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.79E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	4.44E-07	=	[	4.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	1.78E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	1.35E-08	=	[	1.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	8.97E-10	=	[	9.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.57E-07	=	[	4.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	7.47E-09	=	[	7.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	9.06E-07	=	[	9.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.13E-07	=	[	6.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	2.74E-09	=	[	2.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Di-n-butylphthalate	7.81E-09	=	[	7.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	5.40E-12	=	[	5.4E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	8.47E-12	=	[	8.5E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	7.85E-07	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	7.16E-10	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.04E-07	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	2.97E-07	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.58E-07	=	[	5.02E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	7.83E-10	=	[	1.37E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	1.14E-07	=	[	2.00E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	3.25E-07	=	[	5.70E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.83E-02	x	0.00E+00	=	0.00E+00	2.00E-02	/	1.00E+00	=	2.00E-02
Antimony	6.68E-07	x	0.00E+00	=	0.00E+00	7.31E-07	/	4.00E-04	=	1.83E-03
Arsenic	1.31E-05	x	1.50E+00	=	1.97E-05	1.43E-05	/	3.00E-04	=	4.78E-02
Barium	2.36E-04	x	0.00E+00	=	0.00E+00	2.58E-04	/	2.00E-01	=	1.29E-03
Beryllium	5.19E-07	x	0.00E+00	=	0.00E+00	5.68E-07	/	2.00E-03	=	2.84E-04
Cadmium	3.59E-07	x	0.00E+00	=	0.00E+00	3.93E-07	/	1.00E-03	=	3.93E-04
Chromium	4.39E-05	x	0.00E+00	=	0.00E+00	4.80E-05	/	3.00E-03	=	1.60E-02
Cobalt	2.66E-05	x	0.00E+00	=	0.00E+00	2.91E-05	/	3.00E-04	=	9.70E-02
Copper	3.19E-05	x	0.00E+00	=	0.00E+00	3.48E-05	/	4.00E-02	=	8.71E-04
Fluoride	4.33E-06	x	0.00E+00	=	0.00E+00	4.73E-06	/	4.00E-02	=	1.18E-04
Iron	6.82E-02	x	0.00E+00	=	0.00E+00	7.45E-02	/	7.00E-01	=	1.06E-01
Lithium	1.98E-05	x	0.00E+00	=	0.00E+00	2.16E-05	/	2.00E-03	=	1.08E-02
Manganese	1.07E-03	x	0.00E+00	=	0.00E+00	1.17E-03	/	1.40E-01	=	8.33E-03
Molybdenum	5.22E-06	x	0.00E+00	=	0.00E+00	5.71E-06	/	5.00E-03	=	1.14E-03
Nickel	3.42E-05	x	0.00E+00	=	0.00E+00	3.74E-05	/	2.00E-02	=	1.87E-03
Nitrate	8.47E-05	x	0.00E+00	=	0.00E+00	9.27E-05	/	7.10E+00	=	1.31E-05
Nitrite	3.39E-06	x	0.00E+00	=	0.00E+00	3.71E-06	/	3.00E-01	=	1.24E-05
Selenium	2.57E-06	x	0.00E+00	=	0.00E+00	2.81E-06	/	5.00E-03	=	5.61E-04
Silver	1.71E-07	x	0.00E+00	=	0.00E+00	1.87E-07	/	5.00E-03	=	3.74E-05
Strontium	8.72E-05	x	0.00E+00	=	0.00E+00	9.54E-05	/	6.00E-01	=	1.59E-04
Total Uranium	1.42E-06	x	0.00E+00	=	0.00E+00	1.56E-06	/	3.00E-03	=	5.19E-04
Vanadium	1.73E-04	x	0.00E+00	=	0.00E+00	1.89E-04	/	5.00E-03	=	3.78E-02
Zinc	1.17E-04	x	0.00E+00	=	0.00E+00	1.28E-04	/	3.00E-01	=	4.27E-04
Butylbenzylphthalate	5.22E-07	x	1.90E-03	=	9.93E-10	5.71E-07	/	2.00E-01	=	2.86E-06
Di-n-butylphthalate	1.49E-06	x	0.00E+00	=	0.00E+00	1.63E-06	/	1.00E-01	=	1.63E-05
Styrene	1.03E-09	x	0.00E+00	=	0.00E+00	1.13E-09	/	2.00E-01	=	5.63E-09
Toluene	1.61E-09	x	0.00E+00	=	0.00E+00	1.77E-09	/	8.00E-02	=	2.21E-08
			Pathway total	=	1.97E-05			Pathway total	=	3.54E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.77E-05	x		=	NA	9.60E-05	/[	5.00E-03	x	1000	]=	1.92E-05
Antimony	3.20E-09	x		=	NA	3.50E-09	/[		x	1000	]=	NA
Arsenic	6.29E-08	x	4.30E-03	=	2.70E-10	6.88E-08	/[	1.50E-05	x	1000	]=	4.58E-06
Barium	1.13E-06	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.48E-06
Beryllium	2.49E-09	x	2.40E-03	=	5.98E-12	2.72E-09	/[	2.00E-05	x	1001	]=	1.36E-07
Cadmium	1.72E-09	x	1.80E-03	=	3.10E-12	1.88E-09	/[	1.00E-05	x	1002	]=	1.88E-07
Chromium	2.10E-07	x	8.40E-02	=	1.77E-08	2.30E-07	/[	1.00E-04	x	1003	]=	2.29E-06
Cobalt	1.28E-07	x	9.00E-03	=	1.15E-09	1.39E-07	/[	6.00E-06	x	1004	]=	2.32E-05
Copper	1.53E-07	x		=	NA	1.67E-07	/[		x	1005	]=	NA
Fluoride	2.08E-08	x		=	NA	2.27E-08	/[	1.30E-02	x	1000	]=	1.75E-09
Iron	3.27E-04	x		=	NA	3.57E-04	/[		x	1000	]=	NA
Lithium	9.47E-08	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Manganese	5.11E-06	x		=	NA	5.59E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Molybdenum	2.50E-08	x	0.00E+00	=	0.00E+00	2.74E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.64E-07	x	2.60E-04	=	4.26E-11	1.79E-07	/[	9.00E-05	x	1000	]=	1.99E-06
Nitrate	4.06E-07	x		=	NA	4.44E-07	/[		x	1000	]=	NA
Nitrite	1.63E-08	x		=	NA	1.78E-08	/[		x	1000	]=	NA
Selenium	1.23E-08	x	0.00E+00	=	0.00E+00	1.35E-08	/[	2.00E-02	x	1000	]=	6.73E-10
Silver	8.20E-10	x		=	NA	8.97E-10	/[		x	1000	]=	NA
Strontium	4.18E-07	x		=	NA	4.57E-07	/[		x	1000	]=	NA
Total Uranium	6.83E-09	x		=	NA	7.47E-09	/[	4.00E-05	x	1000	]=	1.87E-07
Vanadium	8.28E-07	x		=	NA	9.06E-07	/[	1.00E-04	x	1000	]=	9.06E-06
Zinc	5.61E-07	x		=	NA	6.13E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.50E-09	x	0.00E+00	=	0.00E+00	2.74E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	7.14E-09	x	0.00E+00	=	0.00E+00	7.81E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.93E-12	x	0.00E+00	=	0.00E+00	5.40E-12	/[	1.00E+00	x	1000	]=	5.40E-15
Toluene	7.74E-12	x	0.00E+00	=	0.00E+00	8.47E-12	/	5.00E+00	x	1000	]=	1.69E-15
			Pathway total =		1.91E-08					Pathway total =		1.75E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.85E-07	x	1.50E+00	=	1.18E-06	8.58E-07	/	3.00E-04	=	2.86E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	7.16E-10	x		=	NA	7.83E-10	/	2.50E-05	=	3.13E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	1.04E-07	x	1.90E-03	=	1.98E-10	1.14E-07	/	2.00E-01	=	5.70E-07
Di-n-butylphthalate	2.97E-07	x		=	NA	3.25E-07	/	1.00E-01	=	3.25E-06
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.18E-06			Pathway total =		2.90E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03
Arsenic	Sum of all pathways	=	2.08E-05	100%	Sum of all pathways	=	5.1E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03
Beryllium	Sum of all pathways	=	5.98E-12		Sum of all pathways	=	2.8E-04
Cadmium	Sum of all pathways	=	3.10E-12		Sum of all pathways	=	4.2E-04
Chromium	Sum of all pathways	=	1.77E-08		Sum of all pathways	=	1.6E-02
Cobalt	Sum of all pathways	=	1.15E-09		Sum of all pathways	=	9.7E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.7E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	8.4E-03
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Nickel	Sum of all pathways	=	4.26E-11		Sum of all pathways	=	1.9E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-05
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	5.6E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.2E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.8E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04
Butylbenzylphthalate	Sum of all pathways	=	1.19E-09		Sum of all pathways	=	3.4E-06
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-05
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	5.6E-09
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-08

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**2.09E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	3.57E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.02E-02	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	5.64E-06	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	2.06E-05	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	6.37E-04	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	8.57E-07	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	1.15E-04	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	2.95E-07	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	3.03E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.16E-05	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.60E-05	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	4.00E-06	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.30E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.27E-05	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.00E-03	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	4.23E-08	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	3.58E-05	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.41E-05	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	6.53E-06	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	1.63E-07	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	3.27E-04	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	9.40E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.70E-06	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.42E-04	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.37E-04	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.41E-06	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.03E-07	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.21E-02	=	[	7.74E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	6.17E-06	=	[	2.16E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.25E-05	=	[	7.89E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	6.97E-04	=	[	2.44E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	9.37E-07	=	[	3.28E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	1.25E-04	=	[	4.39E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	3.23E-07	=	[	1.13E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	3.31E-05	=	[	1.16E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.36E-05	=	[	8.27E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.94E-05	=	[	1.38E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	4.37E-06	=	[	1.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.89E-02	=	[	2.41E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.48E-05	=	[	8.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.09E-03	=	[	3.83E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	4.63E-08	=	[	1.62E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.91E-05	=	[	1.37E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.64E-05	=	[	9.23E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	7.14E-06	=	[	2.50E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	1.78E-07	=	[	6.24E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	3.57E-04	=	[	1.25E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	1.03E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.86E-06	=	[	6.50E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.55E-04	=	[	5.43E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.49E-04	=	[	5.23E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	5.91E-06	=	[	2.07E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	2.22E-07	=	[	7.78E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.69E-05	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.71E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	9.88E-08	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	3.06E-06	=	[	3.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	4.11E-09	=	[	4.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	5.50E-07	=	[	6.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.42E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.45E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.04E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.73E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.92E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.02E-04	=	[	3.3E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.09E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.80E-06	=	[	5.2E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.03E-10	=	[	2.2E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.72E-07	=	[	1.9E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.16E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.13E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	7.82E-10	=	[	8.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	1.57E-06	=	[	1.7E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	4.51E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.15E-09	=	[	8.9E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	6.80E-07	=	[	7.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.55E-07	=	[	7.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.59E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.74E-10	=	[	1.1E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	1.06E-04	=	[1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	2.96E-08	=	[3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	1.08E-07	=	[1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	3.34E-06	=	[3.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	4.49E-09	=	[4.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	6.01E-07	=	[6.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.55E-09	=	[1.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.59E-07	=	[1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.13E-07	=	[1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.89E-07	=	[1.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.10E-08	=	[2.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.30E-04	=	[3.3E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.19E-07	=	[1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.25E-06	=	[5.2E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.22E-10	=	[2.2E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.88E-07	=	[1.9E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.26E-07	=	[1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	3.42E-08	=	[3.4E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	8.55E-10	=	[8.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	1.71E-06	=	[1.7E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	4.93E-08	=	[4.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	8.91E-09	=	[8.9E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	7.44E-07	=	[7.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	7.16E-07	=	[7.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	2.84E-08	=	[2.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.07E-09	=	[1.1E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.23E-06	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	5.89E-10	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.08E-06	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	4.05E-08	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.35E-06	=	[	7.89E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.44E-10	=	[	1.13E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.18E-06	=	[	2.07E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	4.43E-08	=	[	7.78E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.02E-02	x	0.00E+00	=	0.00E+00	2.21E-02	/	1.00E+00	=	2.21E-02
Antimony	5.64E-06	x	0.00E+00	=	0.00E+00	6.17E-06	/	4.00E-04	=	1.54E-02
Arsenic	2.06E-05	x	1.50E+00	=	3.09E-05	2.25E-05	/	3.00E-04	=	7.51E-02
Barium	6.37E-04	x	0.00E+00	=	0.00E+00	6.97E-04	/	2.00E-01	=	3.49E-03
Beryllium	8.57E-07	x	0.00E+00	=	0.00E+00	9.37E-07	/	2.00E-03	=	4.69E-04
Boron	1.15E-04	x	0.00E+00	=	0.00E+00	1.25E-04	/	2.00E-01	=	6.27E-04
Cadmium	2.95E-07	x	0.00E+00	=	0.00E+00	3.23E-07	/	1.00E-03	=	3.23E-04
Chromium	3.03E-05	x	0.00E+00	=	0.00E+00	3.31E-05	/	3.00E-03	=	1.10E-02
Cobalt	2.16E-05	x	0.00E+00	=	0.00E+00	2.36E-05	/	3.00E-04	=	7.88E-02
Copper	3.60E-05	x	0.00E+00	=	0.00E+00	3.94E-05	/	4.00E-02	=	9.86E-04
Fluoride	4.00E-06	x	0.00E+00	=	0.00E+00	4.37E-06	/	4.00E-02	=	1.09E-04
Iron	6.30E-02	x	0.00E+00	=	0.00E+00	6.89E-02	/	7.00E-01	=	9.84E-02
Lithium	2.27E-05	x	0.00E+00	=	0.00E+00	2.48E-05	/	2.00E-03	=	1.24E-02
Manganese	1.00E-03	x	0.00E+00	=	0.00E+00	1.09E-03	/	1.40E-01	=	7.82E-03
Mercury	4.23E-08	x	0.00E+00	=	0.00E+00	4.63E-08	/	0.00E+00	=	NA
Nickel	3.58E-05	x	0.00E+00	=	0.00E+00	3.91E-05	/	2.00E-02	=	1.96E-03
Nitrate	2.41E-05	x	0.00E+00	=	0.00E+00	2.64E-05	/	7.10E+00	=	3.71E-06
Nitrite	6.53E-06	x	0.00E+00	=	0.00E+00	7.14E-06	/	3.00E-01	=	2.38E-05
Silver	1.63E-07	x	0.00E+00	=	0.00E+00	1.78E-07	/	5.00E-03	=	3.57E-05
Strontium	3.27E-04	x	0.00E+00	=	0.00E+00	3.57E-04	/	6.00E-01	=	5.95E-04
Tin	9.40E-06	x	0.00E+00	=	0.00E+00	1.03E-05	/	6.00E-01	=	1.71E-05
Total Uranium	1.70E-06	x	0.00E+00	=	0.00E+00	1.86E-06	/	3.00E-03	=	6.19E-04
Vanadium	1.42E-04	x	0.00E+00	=	0.00E+00	1.55E-04	/	5.00E-03	=	3.10E-02
Zinc	1.37E-04	x	0.00E+00	=	0.00E+00	1.49E-04	/	3.00E-01	=	4.98E-04
Bis(2-ethylhexyl) phthalate	5.41E-06	x	1.40E-02	=	7.57E-08	5.91E-06	/	2.00E-02	=	2.96E-04
Butylbenzylphthalate	2.03E-07	x	1.90E-03	=	3.86E-10	2.22E-07	/	2.00E-01	=	1.11E-06
			Pathway total	=	3.10E-05			Pathway total	=	3.62E-01

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
	ug/m^3		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	9.69E-05	x		=	NA	1.06E-04	/[	5.00E-03	x	1000	]=	2.12E-05
Antimony	2.71E-08	x		=	NA	2.96E-08	/[		x	1000	]=	NA
Arsenic	9.88E-08	x	4.30E-03	=	4.25E-10	1.08E-07	/[	1.50E-05	x	1000	]=	7.21E-06
Barium	3.06E-06	x		=	NA	3.34E-06	/[	5.00E-04	x	1000	]=	6.68E-06
Beryllium	4.11E-09	x	2.40E-03	=	9.86E-12	4.49E-09	/[	2.00E-05	x	1000	]=	2.25E-07
Boron	5.50E-07	x	0.00E+00	=	0.00E+00	6.01E-07	/[	2.00E-02	x	1000	]=	3.01E-08
Cadmium	1.42E-09	x	1.80E-03	=	2.55E-12	1.55E-09	/[	1.00E-05	x	1000	]=	1.55E-07
Chromium	1.45E-07	x	8.40E-02	=	1.22E-08	1.59E-07	/[	1.00E-04	x	1000	]=	1.59E-06
Cobalt	1.04E-07	x	9.00E-03	=	9.32E-10	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.73E-07	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Fluoride	1.92E-08	x		=	NA	2.10E-08	/[	1.30E-02	x	1000	]=	1.61E-09
Iron	3.02E-04	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.09E-07	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	4.80E-06	x		=	NA	5.25E-06	/[	5.00E-05	x	1000	]=	1.05E-04
Mercury	2.03E-10	x	0.00E+00	=	0.00E+00	2.22E-10	/[	3.00E-04	x	1000	]=	7.40E-10
Nickel	1.72E-07	x	2.60E-04	=	4.46E-11	1.88E-07	/[	9.00E-05	x	1000	]=	2.09E-06
Nitrate	1.16E-07	x		=	NA	1.26E-07	/[		x	1000	]=	NA
Nitrite	3.13E-08	x		=	NA	3.42E-08	/[		x	1000	]=	NA
Silver	7.82E-10	x		=	NA	8.55E-10	/[		x	1000	]=	NA
Strontium	1.57E-06	x		=	NA	1.71E-06	/[		x	1000	]=	NA
Tin	4.51E-08	x		=	NA	4.93E-08	/[		x	1000	]=	NA
Total Uranium	8.15E-09	x		=	NA	8.91E-09	/[	4.00E-05	x	1000	]=	2.23E-07
Vanadium	6.80E-07	x		=	NA	7.44E-07	/[	1.00E-04	x	1000	]=	7.44E-06
Zinc	6.55E-07	x		=	NA	7.16E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.59E-08	x	2.40E-06	=	6.22E-14	2.84E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	9.74E-10	x	0.00E+00	=	0.00E+00	1.07E-09	/		x	1000	]=	NA
			Pathway total =		1.36E-08					Pathway total =		1.71E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.23E-06	x	1.50E+00	=	1.85E-06	1.35E-06	/	3.00E-04	=	4.50E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	5.89E-10	x		=	NA	6.44E-10	/	2.50E-05	=	2.58E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	1.08E-06	x	1.40E-02	=	1.51E-08	1.18E-06	/	2.00E-02	=	5.90E-05
Butylbenzylphthalate	4.05E-08	x	1.90E-03	=	7.70E-11	4.43E-08	/	2.00E-01	=	2.22E-07
			Pathway total =		1.87E-06			Pathway total =		4.58E-03

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02
Arsenic	Sum of all pathways	=	3.28E-05	100%	Sum of all pathways	=	8.0E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-03
Beryllium	Sum of all pathways	=	9.86E-12		Sum of all pathways	=	4.7E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	6.3E-04
Cadmium	Sum of all pathways	=	2.55E-12		Sum of all pathways	=	3.5E-04
Chromium	Sum of all pathways	=	1.22E-08		Sum of all pathways	=	1.1E-02
Cobalt	Sum of all pathways	=	9.32E-10		Sum of all pathways	=	7.9E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.9E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	9.8E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	7.9E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-10
Nickel	Sum of all pathways	=	4.46E-11		Sum of all pathways	=	2.0E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	6.0E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	5.0E-04
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	9.08E-08		Sum of all pathways	=	3.5E-04
Butylbenzylphthalate	Sum of all pathways	=	4.63E-10		Sum of all pathways	=	1.3E-06

Total Carcinogenic Risk All Pathways and Chemicals	=	3.29E-05

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.67E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.67E-02	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	7.04E-07	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	9.40E-06	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.18E-04	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	4.28E-07	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	2.50E-07	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	2.53E-05	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.16E-05	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.18E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	3.30E-06	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	5.50E-02	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	1.85E-05	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	9.30E-04	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	4.47E-08	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	6.40E-06	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	3.43E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.01E-05	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	8.10E-06	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	3.53E-06	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	2.45E-07	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	8.10E-05	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.80E-06	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.54E-04	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	9.93E-05	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	1.21E-07	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
1-Butanol	5.80E-08	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.81E-06	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	1.55E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	1.58E-07	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	5.92E-08	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.83E-02	=	[	6.40E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	7.70E-07	=	[	2.69E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.03E-05	=	[	3.60E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.38E-04	=	[	8.34E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	4.68E-07	=	[	1.64E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	2.73E-07	=	[	9.56E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	2.77E-05	=	[	9.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.36E-05	=	[	8.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.48E-05	=	[	1.22E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	3.61E-06	=	[	1.26E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.02E-02	=	[	2.11E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.02E-05	=	[	7.07E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.02E-03	=	[	3.56E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	4.89E-08	=	[	1.71E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	7.00E-06	=	[	2.45E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.75E-05	=	[	1.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.20E-05	=	[	7.68E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	8.86E-06	=	[	3.10E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	3.86E-06	=	[	1.35E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	2.69E-07	=	[	9.40E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	8.86E-05	=	[	3.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.96E-06	=	[	6.88E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.69E-04	=	[	5.91E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.09E-04	=	[	3.80E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	1.32E-07	=	[	4.62E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
1-Butanol	6.34E-08	=	[	2.22E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	5.26E-06	=	[	1.84E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	1.69E-07	=	[	5.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	1.73E-07	=	[	6.05E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	6.47E-08	=	[	2.27E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.01E-05	=	[	8.8E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.37E-09	=	[	3.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	4.51E-08	=	[	4.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.05E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.05E-09	=	[	2.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.20E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.21E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.52E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	1.58E-08	=	[	1.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	2.64E-04	=	[	2.9E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	8.85E-08	=	[	9.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.46E-06	=	[	4.9E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.14E-10	=	[	2.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	3.07E-08	=	[	3.4E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.64E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	9.62E-08	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	3.88E-08	=	[	4.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	1.69E-08	=	[	1.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	1.18E-09	=	[	1.3E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	3.88E-07	=	[	4.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.61E-09	=	[	9.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	7.40E-07	=	[	8.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	4.76E-07	=	[	5.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	5.79E-10	=	[	6.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
1-Butanol	2.78E-10	=	[	3.0E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.30E-08	=	[	2.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	7.41E-10	=	[	8.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Hexane	7.58E-10	=	[	8.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	2.84E-10	=	[	3.1E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																
Aluminum	8.76E-05	=	8.8E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.69E-09	=	3.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	4.93E-08	=	4.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.14E-06	=	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.24E-09	=	2.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.31E-09	=	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.33E-07	=	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.13E-07	=	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.67E-07	=	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	1.73E-08	=	1.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	2.89E-04	=	2.9E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	9.68E-08	=	9.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.88E-06	=	4.9E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.34E-10	=	2.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	3.36E-08	=	3.4E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.80E-07	=	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.05E-07	=	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	4.25E-08	=	4.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	1.85E-08	=	1.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	1.29E-09	=	1.3E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.25E-07	=	4.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.42E-09	=	9.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.10E-07	=	8.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	5.21E-07	=	5.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	6.33E-10	=	6.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
1-Butanol	3.04E-10	=	3.0E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	2.52E-08	=	2.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	8.11E-10	=	8.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Hexane	8.29E-10	=	8.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.10E-10	=	3.1E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	5.63E-07	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	4.98E-10	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
1-Butanol	1.16E-08	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	9.59E-07	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	3.09E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.18E-08	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	6.15E-07	=	[	3.60E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	5.45E-10	=	[	9.56E-02	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
1-Butanol	1.27E-08	=	[	2.22E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.05E-06	=	[	1.84E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.37E-08	=	[	5.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.29E-08	=	[	2.27E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.67E-02	x	0.00E+00	=	0.00E+00	1.83E-02	/	1.00E+00	=	1.83E-02
Antimony	7.04E-07	x	0.00E+00	=	0.00E+00	7.70E-07	/	4.00E-04	=	1.92E-03
Arsenic	9.40E-06	x	1.50E+00	=	1.41E-05	1.03E-05	/	3.00E-04	=	3.43E-02
Barium	2.18E-04	x	0.00E+00	=	0.00E+00	2.38E-04	/	2.00E-01	=	1.19E-03
Beryllium	4.28E-07	x	0.00E+00	=	0.00E+00	4.68E-07	/	2.00E-03	=	2.34E-04
Cadmium	2.50E-07	x	0.00E+00	=	0.00E+00	2.73E-07	/	1.00E-03	=	2.73E-04
Chromium	2.53E-05	x	0.00E+00	=	0.00E+00	2.77E-05	/	3.00E-03	=	9.22E-03
Cobalt	2.16E-05	x	0.00E+00	=	0.00E+00	2.36E-05	/	3.00E-04	=	7.87E-02
Copper	3.18E-05	x	0.00E+00	=	0.00E+00	3.48E-05	/	4.00E-02	=	8.70E-04
Fluoride	3.30E-06	x	0.00E+00	=	0.00E+00	3.61E-06	/	4.00E-02	=	9.03E-05
Iron	5.50E-02	x	0.00E+00	=	0.00E+00	6.02E-02	/	7.00E-01	=	8.60E-02
Lithium	1.85E-05	x	0.00E+00	=	0.00E+00	2.02E-05	/	2.00E-03	=	1.01E-02
Manganese	9.30E-04	x	0.00E+00	=	0.00E+00	1.02E-03	/	1.40E-01	=	7.26E-03
Mercury	4.47E-08	x	0.00E+00	=	0.00E+00	4.89E-08	/	0.00E+00	=	NA
Molybdenum	6.40E-06	x	0.00E+00	=	0.00E+00	7.00E-06	/	5.00E-03	=	1.40E-03
Nickel	3.43E-05	x	0.00E+00	=	0.00E+00	3.75E-05	/	2.00E-02	=	1.88E-03
Nitrate	2.01E-05	x	0.00E+00	=	0.00E+00	2.20E-05	/	7.10E+00	=	3.09E-06
Nitrite	8.10E-06	x	0.00E+00	=	0.00E+00	8.86E-06	/	3.00E-01	=	2.95E-05
Selenium	3.53E-06	x	0.00E+00	=	0.00E+00	3.86E-06	/	5.00E-03	=	7.71E-04
Silver	2.45E-07	x	0.00E+00	=	0.00E+00	2.69E-07	/	5.00E-03	=	5.37E-05
Strontium	8.10E-05	x	0.00E+00	=	0.00E+00	8.86E-05	/	6.00E-01	=	1.48E-04
Total Uranium	1.80E-06	x	0.00E+00	=	0.00E+00	1.96E-06	/	3.00E-03	=	6.55E-04
Vanadium	1.54E-04	x	0.00E+00	=	0.00E+00	1.69E-04	/	5.00E-03	=	3.38E-02
Zinc	9.93E-05	x	0.00E+00	=	0.00E+00	1.09E-04	/	3.00E-01	=	3.62E-04
Acetone	1.21E-07	x	0.00E+00	=	0.00E+00	1.32E-07	/	9.00E-01	=	1.47E-07
1-Butanol	5.80E-08	x	0.00E+00	=	0.00E+00	6.34E-08	/	1.00E-01	=	6.34E-07
Bis(2-ethylhexyl) phthalate	4.81E-06	x	1.40E-02	=	6.73E-08	5.26E-06	/	2.00E-02	=	2.63E-04
Butylbenzylphthalate	1.55E-07	x	1.90E-03	=	2.94E-10	1.69E-07	/	2.00E-01	=	8.46E-07
Hexane	1.58E-07	x	0.00E+00	=	0.00E+00	1.73E-07	/	6.00E-02	=	2.88E-06
beta-BHC	5.92E-08	x	1.80E+00	=	1.07E-07	6.47E-08	/	0.00E+00	=	NA
			Pathway total	=	1.43E-05			Pathway total	=	2.88E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.01E-05	x		=	NA	8.76E-05	/[	5.00E-03	x	1000	]=	1.75E-05
Antimony	3.37E-09	x		=	NA	3.69E-09	/[		x	1000	]=	NA
Arsenic	4.51E-08	x	4.30E-03	=	1.94E-10	4.93E-08	/[	1.50E-05	x	1000	]=	3.29E-06
Barium	1.05E-06	x		=	NA	1.14E-06	/[	5.00E-04	x	1000	]=	2.29E-06
Beryllium	2.05E-09	x	2.40E-03	=	4.93E-12	2.24E-09	/[	2.00E-05	x	1000	]=	1.12E-07
Cadmium	1.20E-09	x	1.80E-03	=	2.16E-12	1.31E-09	/[	1.00E-05	x	1000	]=	1.31E-07
Chromium	1.21E-07	x	8.40E-02	=	1.02E-08	1.33E-07	/[	1.00E-04	x	1000	]=	1.33E-06
Cobalt	1.03E-07	x	9.00E-03	=	9.31E-10	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.52E-07	x		=	NA	1.67E-07	/[		x	1000	]=	NA
Fluoride	1.58E-08	x		=	NA	1.73E-08	/[	1.30E-02	x	1000	]=	1.33E-09
Iron	2.64E-04	x		=	NA	2.89E-04	/[		x	1000	]=	NA
Lithium	8.85E-08	x		=	NA	9.68E-08	/[		x	1000	]=	NA
Manganese	4.46E-06	x		=	NA	4.88E-06	/[	5.00E-05	x	1000	]=	9.75E-05
Mercury	2.14E-10	x	0.00E+00	=	0.00E+00	2.34E-10	/[	3.00E-04	x	1000	]=	7.81E-10
Molybdenum	3.07E-08	x	0.00E+00	=	0.00E+00	3.36E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.64E-07	x	2.60E-04	=	4.28E-11	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	9.62E-08	x		=	NA	1.05E-07	/[		x	1000	]=	NA
Nitrite	3.88E-08	x		=	NA	4.25E-08	/[		x	1000	]=	NA
Selenium	1.69E-08	x	0.00E+00	=	0.00E+00	1.85E-08	/[	2.00E-02	x	1000	]=	9.25E-10
Silver	1.18E-09	x		=	NA	1.29E-09	/[		x	1000	]=	NA
Strontium	3.88E-07	x		=	NA	4.25E-07	/[		x	1000	]=	NA
Total Uranium	8.61E-09	x		=	NA	9.42E-09	/[	4.00E-05	x	1000	]=	2.36E-07
Vanadium	7.40E-07	x		=	NA	8.10E-07	/[	1.00E-04	x	1000	]=	8.10E-06
Zinc	4.76E-07	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Acetone	5.79E-10	x	0.00E+00	=	0.00E+00	6.33E-10	/[	3.10E+01	x	1000	]=	2.04E-14
1-Butanol	2.78E-10	x	0.00E+00	=	0.00E+00	3.04E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.30E-08	x	2.40E-06	=	5.53E-14	2.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	7.41E-10	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	7.58E-10	x	0.00E+00	=	0.00E+00	8.29E-10	/[	7.00E-01	x	1000	]=	1.18E-12
beta-BHC	2.84E-10	x	5.30E-04	=	1.50E-13	3.10E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.14E-08					Pathway total =		1.51E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.63E-07	x	1.50E+00	=	8.44E-07	6.15E-07	/	3.00E-04	=	2.05E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.98E-10	x		=	NA	5.45E-10	/	2.50E-05	=	2.18E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	1.16E-08	x		=	NA	1.27E-08	/	1.00E-01	=	1.27E-07
Bis(2-ethylhexyl) phthalate	9.59E-07	x	1.40E-02	=	1.34E-08	1.05E-06	/	2.00E-02	=	5.24E-05
Butylbenzylphthalate	3.09E-08	x	1.90E-03	=	5.86E-11	3.37E-08	/	2.00E-01	=	1.69E-07
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	1.18E-08	x	1.80E+00	=	2.12E-08	1.29E-08	/		=	NA
			Pathway total =		8.79E-07			Pathway total =		2.13E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03
Arsenic	Sum of all pathways	=	1.49E-05	99%	Sum of all pathways	=	3.6E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Beryllium	Sum of all pathways	=	4.93E-12		Sum of all pathways	=	2.3E-04
Cadmium	Sum of all pathways	=	2.16E-12		Sum of all pathways	=	3.0E-04
Chromium	Sum of all pathways	=	1.02E-08		Sum of all pathways	=	9.2E-03
Cobalt	Sum of all pathways	=	9.31E-10		Sum of all pathways	=	7.9E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.7E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	9.0E-05
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	8.6E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.8E-10
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03
Nickel	Sum of all pathways	=	4.28E-11		Sum of all pathways	=	1.9E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	7.7E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	5.4E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	6.6E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.6E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-07
1-Butanol	Sum of all pathways	=	NA		Sum of all pathways	=	7.6E-07
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	8.07E-08		Sum of all pathways	=	3.2E-04
Butylbenzylphthalate	Sum of all pathways	=	3.52E-10		Sum of all pathways	=	1.0E-06
Hexane	Sum of all pathways	=	NA		Sum of all pathways	=	2.9E-06
beta-BHC	Sum of all pathways	=	1.28E-07		Sum of all pathways	=	NA

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.52E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.90E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.86E-02	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	6.14E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.32E-05	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.13E-04	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	7.21E-07	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	3.15E-07	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	3.24E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.39E-05	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.34E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	7.50E-06	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.61E-02	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.19E-05	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	9.52E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	5.02E-08	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	2.90E-05	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.99E-05	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.20E-05	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	4.63E-07	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	8.66E-05	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Tin	3.76E-05	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	4.10E-06	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	2.03E-04	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	4.79E-04	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	2.56E-08	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.01E-06	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	2.25E-06	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	3.50E-09	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	7.68E-10	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	6.74E-08	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	7.00E-08	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.04E-02	=	[	7.13E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	6.72E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.45E-05	=	[	5.06E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.33E-04	=	[	8.15E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	7.89E-07	=	[	2.76E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	3.45E-07	=	[	1.21E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	3.54E-05	=	[	1.24E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.62E-05	=	[	9.16E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.65E-05	=	[	1.28E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	8.21E-06	=	[	2.87E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	7.23E-02	=	[	2.53E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.39E-05	=	[	8.37E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.04E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	5.49E-08	=	[	1.92E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.17E-05	=	[	1.11E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	3.27E-05	=	[	1.14E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.32E-05	=	[	4.61E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	5.07E-07	=	[	1.77E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	9.47E-05	=	[	3.31E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Tin	4.11E-05	=	[	1.44E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	4.48E-06	=	[	1.57E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	2.22E-04	=	[	7.78E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	5.24E-04	=	[	1.83E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	2.80E-08	=	[	9.80E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	6.57E-06	=	[	2.30E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	2.47E-06	=	[	8.63E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	3.83E-09	=	[	1.34E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	8.40E-10	=	[	2.94E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	7.37E-08	=	[	2.58E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	7.66E-08	=	[	2.68E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.93E-05	=	[	9.8E-05	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	2.95E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	6.34E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.02E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	3.46E-09	=	[	3.8E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	1.51E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.55E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.15E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.60E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	3.60E-08	=	[	3.9E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.17E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.05E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.56E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.40E-10	=	[	2.6E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.39E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.43E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	5.77E-08	=	[	6.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	2.22E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.15E-07	=	[	4.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Tin	1.80E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	1.96E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	9.74E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	2.30E-06	=	[	2.5E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	1.23E-10	=	[	1.3E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.88E-08	=	[	3.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	1.08E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	1.68E-11	=	[	1.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	3.68E-12	=	[	4.0E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
beta-BHC	3.23E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.36E-10	=	[	3.7E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.76E-05	=	[	9.8E-05	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	6.94E-08	=	[	6.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.12E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	3.78E-09	=	[	3.8E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	1.65E-09	=	[	1.7E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	3.94E-08	=	[	3.9E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.47E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.15E-07	=	[	1.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.63E-10	=	[	2.6E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.52E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.57E-07	=	[	1.6E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	6.31E-08	=	[	6.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	2.43E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	4.54E-07	=	[	4.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Tin	1.97E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	2.15E-08	=	[	2.1E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	2.51E-06	=	[	2.5E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	1.34E-10	=	[	1.3E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Bis(2-ethylhexyl) phthalate	3.15E-08	=	[	3.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Di-n-butylphthalate	1.18E-08	=	[	1.2E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	1.84E-11	=	[	1.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	4.03E-12	=	[	4.0E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
beta-BHC	3.53E-10	=	[	3.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Aroclor-1260	3.67E-10	=	[	3.7E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	7.92E-07	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	6.29E-10	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.20E-06	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Di-n-butylphthalate	4.50E-07	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
beta-BHC	1.34E-08	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Aroclor-1260	1.96E-08	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	8.66E-07	=	[	5.06E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	6.88E-10	=	[	1.21E-01	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Bis(2-ethylhexyl) phthalate	1.31E-06	=	[	2.30E+00	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Di-n-butylphthalate	4.92E-07	=	[	8.63E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
beta-BHC	1.47E-08	=	[	2.58E-02	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Aroclor-1260	2.14E-08	=	[	2.68E-02	x	1.00E-06	x	5,700	x	0.07	x	0.14	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.86E-02	x	0.00E+00	=	0.00E+00	2.04E-02	/	1.00E+00	=	2.04E-02
Antimony	6.14E-07	x	0.00E+00	=	0.00E+00	6.72E-07	/	4.00E-04	=	1.68E-03
Arsenic	1.32E-05	x	1.50E+00	=	1.98E-05	1.45E-05	/	3.00E-04	=	4.82E-02
Barium	2.13E-04	x	0.00E+00	=	0.00E+00	2.33E-04	/	2.00E-01	=	1.16E-03
Beryllium	7.21E-07	x	0.00E+00	=	0.00E+00	7.89E-07	/	2.00E-03	=	3.94E-04
Cadmium	3.15E-07	x	0.00E+00	=	0.00E+00	3.45E-07	/	1.00E-03	=	3.45E-04
Chromium	3.24E-05	x	0.00E+00	=	0.00E+00	3.54E-05	/	3.00E-03	=	1.18E-02
Cobalt	2.39E-05	x	0.00E+00	=	0.00E+00	2.62E-05	/	3.00E-04	=	8.72E-02
Copper	3.34E-05	x	0.00E+00	=	0.00E+00	3.65E-05	/	4.00E-02	=	9.12E-04
Fluoride	7.50E-06	x	0.00E+00	=	0.00E+00	8.21E-06	/	4.00E-02	=	2.05E-04
Iron	6.61E-02	x	0.00E+00	=	0.00E+00	7.23E-02	/	7.00E-01	=	1.03E-01
Lithium	2.19E-05	x	0.00E+00	=	0.00E+00	2.39E-05	/	2.00E-03	=	1.20E-02
Manganese	9.52E-04	x	0.00E+00	=	0.00E+00	1.04E-03	/	1.40E-01	=	7.43E-03
Mercury	5.02E-08	x	0.00E+00	=	0.00E+00	5.49E-08	/	0.00E+00	=	NA
Nickel	2.90E-05	x	0.00E+00	=	0.00E+00	3.17E-05	/	2.00E-02	=	1.59E-03
Nitrate	2.99E-05	x	0.00E+00	=	0.00E+00	3.27E-05	/	7.10E+00	=	4.60E-06
Nitrite	1.20E-05	x	0.00E+00	=	0.00E+00	1.32E-05	/	3.00E-01	=	4.39E-05
Silver	4.63E-07	x	0.00E+00	=	0.00E+00	5.07E-07	/	5.00E-03	=	1.01E-04
Strontium	8.66E-05	x	0.00E+00	=	0.00E+00	9.47E-05	/	6.00E-01	=	1.58E-04
Tin	3.76E-05	x	0.00E+00	=	0.00E+00	4.11E-05	/	6.00E-01	=	6.86E-05
Total Uranium	4.10E-06	x	0.00E+00	=	0.00E+00	4.48E-06	/	3.00E-03	=	1.49E-03
Vanadium	2.03E-04	x	0.00E+00	=	0.00E+00	2.22E-04	/	5.00E-03	=	4.44E-02
Zinc	4.79E-04	x	0.00E+00	=	0.00E+00	5.24E-04	/	3.00E-01	=	1.75E-03
Acetone	2.56E-08	x	0.00E+00	=	0.00E+00	2.80E-08	/	9.00E-01	=	3.11E-08
Bis(2-ethylhexyl) phthalate	6.01E-06	x	1.40E-02	=	8.41E-08	6.57E-06	/	2.00E-02	=	3.29E-04
Di-n-butylphthalate	2.25E-06	x	0.00E+00	=	0.00E+00	2.47E-06	/	1.00E-01	=	2.47E-05
Methylene chloride	3.50E-09	x	2.00E-03	=	7.00E-12	3.83E-09	/	6.00E-03	=	6.38E-07
Toluene	7.68E-10	x	0.00E+00	=	0.00E+00	8.40E-10	/	8.00E-02	=	1.05E-08
beta-BHC	6.74E-08	x	1.80E+00	=	1.21E-07	7.37E-08	/	0.00E+00	=	NA
Aroclor-1260	7.00E-08	x	2.00E+00	=	1.40E-07	7.66E-08	/	0.00E+00	=	NA
			Pathway total	=	2.02E-05			Pathway total	=	3.45E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.93E-05	x		=	NA	9.76E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	2.95E-09	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	6.34E-08	x	4.30E-03	=	2.73E-10	6.94E-08	/[	1.50E-05	x	1000	]=	4.62E-06
Barium	1.02E-06	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Beryllium	3.46E-09	x	2.40E-03	=	8.30E-12	3.78E-09	/[	2.00E-05	x	1000	]=	1.89E-07
Cadmium	1.51E-09	x	1.80E-03	=	2.72E-12	1.65E-09	/[	1.00E-05	x	1000	]=	1.65E-07
Chromium	1.55E-07	x	8.40E-02	=	1.30E-08	1.70E-07	/[	1.00E-04	x	1000	]=	1.70E-06
Cobalt	1.15E-07	x	9.00E-03	=	1.03E-09	1.25E-07	/[	6.00E-06	x	1000	]=	2.09E-05
Copper	1.60E-07	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	3.60E-08	x		=	NA	3.94E-08	/[	1.30E-02	x	1000	]=	3.03E-09
Iron	3.17E-04	x		=	NA	3.47E-04	/[		x	1000	]=	NA
Lithium	1.05E-07	x		=	NA	1.15E-07	/[		x	1000	]=	NA
Manganese	4.56E-06	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.98E-05
Mercury	2.40E-10	x	0.00E+00	=	0.00E+00	2.63E-10	/[	3.00E-04	x	1000	]=	8.77E-10
Nickel	1.39E-07	x	2.60E-04	=	3.62E-11	1.52E-07	/[	9.00E-05	x	1000	]=	1.69E-06
Nitrate	1.43E-07	x		=	NA	1.57E-07	/[		x	1000	]=	NA
Nitrite	5.77E-08	x		=	NA	6.31E-08	/[		x	1000	]=	NA
Silver	2.22E-09	x		=	NA	2.43E-09	/[		x	1000	]=	NA
Strontium	4.15E-07	x		=	NA	4.54E-07	/[		x	1000	]=	NA
Tin	1.80E-07	x		=	NA	1.97E-07	/[		x	1000	]=	NA
Total Uranium	1.96E-08	x		=	NA	2.15E-08	/[	4.00E-05	x	1000	]=	5.37E-07
Vanadium	9.74E-07	x		=	NA	1.07E-06	/[	1.00E-04	x	1000	]=	1.07E-05
Zinc	2.30E-06	x		=	NA	2.51E-06	/[		x	1000	]=	NA
Acetone	1.23E-10	x	0.00E+00	=	0.00E+00	1.34E-10	/[	3.10E+01	x	1000	]=	4.33E-15
Bis(2-ethylhexyl) phthalate	2.88E-08	x	2.40E-06	=	6.91E-14	3.15E-08	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	1.08E-08	x	0.00E+00	=	0.00E+00	1.18E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.68E-11	x	1.00E-08	=	1.68E-19	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	3.68E-12	x	0.00E+00	=	0.00E+00	4.03E-12	/[	5.00E+00	x	1000	]=	8.05E-16
beta-BHC	3.23E-10	x	5.30E-04	=	1.71E-13	3.53E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.36E-10	x	5.70E-04	=	1.91E-13	3.67E-10	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.44E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.92E-07	x	1.50E+00	=	1.19E-06	8.66E-07	/	3.00E-04	=	2.89E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	6.29E-10	x		=	NA	6.88E-10	/	2.50E-05	=	2.75E-05
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	1.20E-06	x	1.40E-02	=	1.68E-08	1.31E-06	/	2.00E-02	=	6.56E-05
Di-n-butylphthalate	4.50E-07	x		=	NA	4.92E-07	/	1.00E-01	=	4.92E-06
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	1.34E-08	x	1.80E+00	=	2.42E-08	1.47E-08	/		=	NA
Aroclor-1260	1.96E-08	x	2.00E+00	=	3.91E-08	2.14E-08	/		=	NA
			Pathway total =		1.27E-06			Pathway total =		2.98E-03

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-03
Arsenic	Sum of all pathways	=	2.10E-05	98%	Sum of all pathways	=	5.1E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-03
Beryllium	Sum of all pathways	=	8.30E-12	0%	Sum of all pathways	=	3.9E-04
Cadmium	Sum of all pathways	=	2.72E-12	0%	Sum of all pathways	=	3.7E-04
Chromium	Sum of all pathways	=	1.30E-08	0%	Sum of all pathways	=	1.2E-02
Cobalt	Sum of all pathways	=	1.03E-09	0%	Sum of all pathways	=	8.7E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.1E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	7.5E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-10
Nickel	Sum of all pathways	=	3.62E-11		Sum of all pathways	=	1.6E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	4.6E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-05
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-04
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	6.9E-05
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-03
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-03
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-08
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.01E-07	0%	Sum of all pathways	=	3.9E-04
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-05
Methylene chloride	Sum of all pathways	=	7.00E-12	0%	Sum of all pathways	=	6.4E-07
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-08
beta-BHC	Sum of all pathways	=	1.46E-07	1%	Sum of all pathways	=	NA
Aroclor-1260	Sum of all pathways	=	1.79E-07	1%	Sum of all pathways	=	NA

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.15E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.48E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.19E-02	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	6.40E-07	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.52E-05	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.07E-04	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	4.57E-07	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	9.06E-06	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	2.93E-05	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.74E-05	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.87E-05	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	9.22E-06	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.77E-02	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.36E-05	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	1.07E-03	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	3.53E-08	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	2.87E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	1.04E-04	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	1.39E-05	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	1.83E-06	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Silver	1.81E-07	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	9.74E-05	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.72E-06	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.68E-04	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.27E-04	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	1.67E-08	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	2.80E-07	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
2-Hexanone	7.24E-09	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	3.66E-09	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	1.55E-09	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.40E-02	=	[	8.39E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	7.00E-07	=	[	2.45E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.67E-05	=	[	5.83E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.26E-04	=	[	7.92E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	5.00E-07	=	[	1.75E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	9.91E-06	=	[	3.47E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	3.20E-05	=	[	1.12E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	3.00E-05	=	[	1.05E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	4.23E-05	=	[	1.48E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	1.01E-05	=	[	3.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	7.40E-02	=	[	2.59E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.59E-05	=	[	9.05E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.17E-03	=	[	4.09E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	3.86E-08	=	[	1.35E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	3.14E-05	=	[	1.10E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	1.13E-04	=	[	3.97E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	1.52E-05	=	[	5.31E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	2.00E-06	=	[	7.01E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Silver	1.98E-07	=	[	6.94E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.07E-04	=	[	3.73E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.89E-06	=	[	6.60E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.83E-04	=	[	6.42E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.39E-04	=	[	4.86E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	1.83E-08	=	[	6.40E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	3.06E-07	=	[	1.07E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
2-Hexanone	7.91E-09	=	[	2.77E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	4.00E-09	=	[	1.40E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	1.69E-09	=	[	5.92E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.05E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.07E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	7.30E-08	=	[	8.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	9.92E-07	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.19E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cadmium	4.35E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.40E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.32E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.85E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	4.42E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	3.24E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.13E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	5.12E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	1.69E-10	=	[	1.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.38E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	4.97E-07	=	[	5.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	6.65E-08	=	[	7.3E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	8.78E-09	=	[	9.6E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Silver	8.69E-10	=	[	9.5E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	4.67E-07	=	[	5.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	8.26E-09	=	[	9.0E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	8.04E-07	=	[	8.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	6.09E-07	=	[	6.7E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	8.02E-11	=	[	8.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.34E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
2-Hexanone	3.47E-11	=	[	3.8E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Methylene chloride	1.75E-11	=	[	1.9E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	7.41E-12	=	[	8.1E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.15E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.36E-09	=	[	3.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	7.99E-08	=	[	8.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	2.40E-09	=	[	2.4E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cadmium	4.75E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.53E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.44E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	2.03E-07	=	[	2.0E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	4.84E-08	=	[	4.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.55E-04	=	[	3.5E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	5.60E-06	=	[	5.6E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	1.85E-10	=	[	1.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	5.44E-07	=	[	5.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	7.27E-08	=	[	7.3E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	9.60E-09	=	[	9.6E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Silver	9.51E-10	=	[	9.5E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	5.11E-07	=	[	5.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	9.04E-09	=	[	9.0E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	8.79E-07	=	[	8.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.66E-07	=	[	6.7E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	8.77E-11	=	[	8.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Butylbenzylphthalate	1.47E-09	=	[	1.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
2-Hexanone	3.79E-11	=	[	3.8E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Methylene chloride	1.92E-11	=	[	1.9E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	8.11E-12	=	[	8.1E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	9.11E-07	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cadmium	1.81E-08	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Butylbenzylphthalate	5.58E-08	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	9.97E-07	=	[	5.83E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cadmium	1.98E-08	=	[	3.47E+00	x	1.00E-06	x	5,700	x	0.07	x	0.001	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Butylbenzylphthalate	6.10E-08	=	[	1.07E-01	x	1.00E-06	x	5,700	x	0.07	x	0.1	x	1	x	365	x	64	]	/	[	70	x	23,360	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.19E-02	x	0.00E+00	=	0.00E+00	2.40E-02	/	1.00E+00	=	2.40E-02
Antimony	6.40E-07	x	0.00E+00	=	0.00E+00	7.00E-07	/	4.00E-04	=	1.75E-03
Arsenic	1.52E-05	x	1.50E+00	=	2.28E-05	1.67E-05	/	3.00E-04	=	5.55E-02
Barium	2.07E-04	x	0.00E+00	=	0.00E+00	2.26E-04	/	2.00E-01	=	1.13E-03
Beryllium	4.57E-07	x	0.00E+00	=	0.00E+00	5.00E-07	/	2.00E-03	=	2.50E-04
Cadmium	9.06E-06	x	0.00E+00	=	0.00E+00	9.91E-06	/	1.00E-03	=	9.91E-03
Chromium	2.93E-05	x	0.00E+00	=	0.00E+00	3.20E-05	/	3.00E-03	=	1.07E-02
Cobalt	2.74E-05	x	0.00E+00	=	0.00E+00	3.00E-05	/	3.00E-04	=	1.00E-01
Copper	3.87E-05	x	0.00E+00	=	0.00E+00	4.23E-05	/	4.00E-02	=	1.06E-03
Fluoride	9.22E-06	x	0.00E+00	=	0.00E+00	1.01E-05	/	4.00E-02	=	2.52E-04
Iron	6.77E-02	x	0.00E+00	=	0.00E+00	7.40E-02	/	7.00E-01	=	1.06E-01
Lithium	2.36E-05	x	0.00E+00	=	0.00E+00	2.59E-05	/	2.00E-03	=	1.29E-02
Manganese	1.07E-03	x	0.00E+00	=	0.00E+00	1.17E-03	/	1.40E-01	=	8.35E-03
Mercury	3.53E-08	x	0.00E+00	=	0.00E+00	3.86E-08	/	0.00E+00	=	NA
Nickel	2.87E-05	x	0.00E+00	=	0.00E+00	3.14E-05	/	2.00E-02	=	1.57E-03
Nitrate	1.04E-04	x	0.00E+00	=	0.00E+00	1.13E-04	/	7.10E+00	=	1.60E-05
Nitrite	1.39E-05	x	0.00E+00	=	0.00E+00	1.52E-05	/	3.00E-01	=	5.06E-05
Selenium	1.83E-06	x	0.00E+00	=	0.00E+00	2.00E-06	/	5.00E-03	=	4.01E-04
Silver	1.81E-07	x	0.00E+00	=	0.00E+00	1.98E-07	/	5.00E-03	=	3.97E-05
Strontium	9.74E-05	x	0.00E+00	=	0.00E+00	1.07E-04	/	6.00E-01	=	1.78E-04
Total Uranium	1.72E-06	x	0.00E+00	=	0.00E+00	1.89E-06	/	3.00E-03	=	6.28E-04
Vanadium	1.68E-04	x	0.00E+00	=	0.00E+00	1.83E-04	/	5.00E-03	=	3.67E-02
Zinc	1.27E-04	x	0.00E+00	=	0.00E+00	1.39E-04	/	3.00E-01	=	4.63E-04
Acetone	1.67E-08	x	0.00E+00	=	0.00E+00	1.83E-08	/	9.00E-01	=	2.03E-08
Butylbenzylphthalate	2.80E-07	x	1.90E-03	=	5.31E-10	3.06E-07	/	2.00E-01	=	1.53E-06
2-Hexanone	7.24E-09	x	0.00E+00	=	0.00E+00	7.91E-09	/	5.00E-03	=	1.58E-06
Methylene chloride	3.66E-09	x	2.00E-03	=	7.31E-12	4.00E-09	/	6.00E-03	=	6.67E-07
Toluene	1.55E-09	x	0.00E+00	=	0.00E+00	1.69E-09	/	8.00E-02	=	2.11E-08
			Pathway total	=	2.28E-05			Pathway total	=	3.72E-01

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	1.05E-04	x		=	NA	1.15E-04	/[	5.00E-03	x	1000	]=	2.30E-05
Antimony	3.07E-09	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	7.30E-08	x	4.30E-03	=	3.14E-10	7.99E-08	/[	1.50E-05	x	1000	]=	5.32E-06
Barium	9.92E-07	x		=	NA	1.08E-06	/[	5.00E-04	x	1000	]=	2.17E-06
Beryllium	2.19E-09	x	2.40E-03	=	5.26E-12	2.40E-09	/[	2.00E-05	x	1000	]=	1.20E-07
Cadmium	4.35E-08	x	1.80E-03	=	7.82E-11	4.75E-08	/[	1.00E-05	x	1000	]=	4.75E-06
Chromium	1.40E-07	x	8.40E-02	=	1.18E-08	1.53E-07	/[	1.00E-04	x	1000	]=	1.53E-06
Cobalt	1.32E-07	x	9.00E-03	=	1.18E-09	1.44E-07	/[	6.00E-06	x	1000	]=	2.40E-05
Copper	1.85E-07	x		=	NA	2.03E-07	/[		x	1000	]=	NA
Fluoride	4.42E-08	x		=	NA	4.84E-08	/[	1.30E-02	x	1000	]=	3.72E-09
Iron	3.24E-04	x		=	NA	3.55E-04	/[		x	1000	]=	NA
Lithium	1.13E-07	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Manganese	5.12E-06	x		=	NA	5.60E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Mercury	1.69E-10	x	0.00E+00	=	0.00E+00	1.85E-10	/[	3.00E-04	x	1000	]=	6.16E-10
Nickel	1.38E-07	x	2.60E-04	=	3.58E-11	1.51E-07	/[	9.00E-05	x	1000	]=	1.67E-06
Nitrate	4.97E-07	x		=	NA	5.44E-07	/[		x	1000	]=	NA
Nitrite	6.65E-08	x		=	NA	7.27E-08	/[		x	1000	]=	NA
Selenium	8.78E-09	x	0.00E+00	=	0.00E+00	9.60E-09	/[	2.00E-02	x	1000	]=	4.80E-10
Silver	8.69E-10	x		=	NA	9.51E-10	/[		x	1000	]=	NA
Strontium	4.67E-07	x		=	NA	5.11E-07	/[		x	1000	]=	NA
Total Uranium	8.26E-09	x		=	NA	9.04E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	8.04E-07	x		=	NA	8.79E-07	/[	1.00E-04	x	1000	]=	8.79E-06
Zinc	6.09E-07	x		=	NA	6.66E-07	/[		x	1000	]=	NA
Acetone	8.02E-11	x	0.00E+00	=	0.00E+00	8.77E-11	/[	3.10E+01	x	1000	]=	2.83E-15
Butylbenzylphthalate	1.34E-09	x	0.00E+00	=	0.00E+00	1.47E-09	/[		x	1000	]=	NA
2-Hexanone	3.47E-11	x	0.00E+00	=	0.00E+00	3.79E-11	/[	3.00E-02	x	1000	]=	1.26E-12
Methylene chloride	1.75E-11	x	1.00E-08	=	1.75E-19	1.92E-11	/[	6.00E-01	x	1000	]=	3.20E-14
Toluene	7.41E-12	x	0.00E+00	=	0.00E+00	8.11E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		1.34E-08					Pathway total =		1.84E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	9.11E-07	x	1.50E+00	=	1.37E-06	9.97E-07	/	3.00E-04	=	3.32E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.81E-08	x		=	NA	1.98E-08	/	2.50E-05	=	7.91E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	5.58E-08	x	1.90E-03	=	1.06E-10	6.10E-08	/	2.00E-01	=	3.05E-07
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.37E-06			Pathway total =		4.11E-03

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03
Arsenic	Sum of all pathways	=	2.42E-05	100%	Sum of all pathways	=	5.9E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Beryllium	Sum of all pathways	=	5.26E-12		Sum of all pathways	=	2.5E-04
Cadmium	Sum of all pathways	=	7.82E-11		Sum of all pathways	=	1.1E-02
Chromium	Sum of all pathways	=	1.18E-08		Sum of all pathways	=	1.1E-02
Cobalt	Sum of all pathways	=	1.18E-09		Sum of all pathways	=	1.0E-01
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.5E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-01
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	8.5E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-10
Nickel	Sum of all pathways	=	3.58E-11		Sum of all pathways	=	1.6E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-05
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	5.1E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-04
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-05
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	6.3E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.6E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-08
Butylbenzylphthalate	Sum of all pathways	=	6.37E-10		Sum of all pathways	=	1.8E-06
2-Hexanone	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-06
Methylene chloride	Sum of all pathways	=	7.31E-12		Sum of all pathways	=	6.7E-07
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.42E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.76E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.16E-02	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	7.60E-07	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.83E-05	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Barium	2.53E-04	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	6.14E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Boron	1.68E-05	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	2.61E-05	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	2.28E-05	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Copper	3.45E-05	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	5.28E-06	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Iron	6.03E-02	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	2.41E-05	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	9.51E-04	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	5.38E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	6.61E-06	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	2.56E-05	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	2.22E-05	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	5.72E-06	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	5.22E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	1.30E-04	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	1.61E-06	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	1.36E-04	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	1.18E-04	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	1.61E-08	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Benzene	8.57E-10	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	9.85E-10	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	1.93E-09	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.36E-02	=	[	8.27E+03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	8.31E-07	=	[	2.91E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	2.00E-05	=	[	7.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Barium	2.77E-04	=	[	9.69E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	6.71E-07	=	[	2.35E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Boron	1.83E-05	=	[	6.42E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	2.86E-05	=	[	1.00E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	2.49E-05	=	[	8.73E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Copper	3.77E-05	=	[	1.32E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	5.77E-06	=	[	2.02E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Iron	6.60E-02	=	[	2.31E+04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	2.64E-05	=	[	9.24E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	1.04E-03	=	[	3.64E+02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	5.89E-08	=	[	2.06E-02	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	7.23E-06	=	[	2.53E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	2.80E-05	=	[	9.80E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	2.43E-05	=	[	8.51E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	6.26E-06	=	[	2.19E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	5.71E-06	=	[	2.00E+00	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	1.42E-04	=	[	4.96E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	1.76E-06	=	[	6.18E-01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	1.48E-04	=	[	5.19E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	1.29E-04	=	[	4.53E+01	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	1.77E-08	=	[	6.18E-03	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Benzene	9.37E-10	=	[	3.28E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	1.08E-09	=	[	3.77E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	2.11E-09	=	[	7.38E-04	x	200	x	1	x	1.00E-06	x	365	x	64	]	/	[	70	x	23,360	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Adult Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.04E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Antimony	3.64E-09	=	[	4.0E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Arsenic	8.77E-08	=	[	9.6E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Barium	1.21E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Beryllium	2.94E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Boron	8.04E-08	=	[	8.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Chromium	1.25E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Cobalt	1.09E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Copper	1.65E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Fluoride	2.53E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Iron	2.89E-04	=	[	3.2E-04	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Lithium	1.16E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Manganese	4.56E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Mercury	2.58E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Molybdenum	3.17E-08	=	[	3.5E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nickel	1.23E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrate	1.07E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Nitrite	2.74E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Selenium	2.50E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Strontium	6.21E-07	=	[	6.8E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Total Uranium	7.73E-09	=	[	8.5E-09	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Vanadium	6.50E-07	=	[	7.1E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Zinc	5.67E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Acetone	7.74E-11	=	[	8.5E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Benzene	4.11E-12	=	[	4.5E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Styrene	4.72E-12	=	[	5.2E-12	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]
Toluene	9.24E-12	=	[	1.0E-11	x	365	x	24.0	x	64	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.13E-04	=	[	1.1E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Antimony	3.99E-09	=	[	4.0E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Arsenic	9.59E-08	=	[	9.6E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Barium	1.33E-06	=	[	1.3E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Beryllium	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Boron	8.79E-08	=	[	8.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Chromium	1.37E-07	=	[	1.4E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Cobalt	1.20E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Copper	1.81E-07	=	[	1.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Fluoride	2.77E-08	=	[	2.8E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Iron	3.16E-04	=	[	3.2E-04	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Lithium	1.27E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Mercury	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Molybdenum	3.47E-08	=	[	3.5E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nickel	1.34E-07	=	[	1.3E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrate	1.17E-07	=	[	1.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Nitrite	3.00E-08	=	[	3.0E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Selenium	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Strontium	6.79E-07	=	[	6.8E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Total Uranium	8.46E-09	=	[	8.5E-09	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Vanadium	7.11E-07	=	[	7.1E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Zinc	6.21E-07	=	[	6.2E-07	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Acetone	8.47E-11	=	[	8.5E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Benzene	4.49E-12	=	[	4.5E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Styrene	5.16E-12	=	[	5.2E-12	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]
Toluene	1.01E-11	=	[	1.0E-11	x	365	x	24.0	x	64	]	/	[(	23,360	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Adult Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Arsenic	1.09E-06	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0	x	1	x	365	x	64	]	/	[	70	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Arsenic	1.20E-06	=	[	7.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.03	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	5,700	x	0.07	x		x	1	x	365	x	64	]	/	[	70	x	23,360	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	5,700	x	0.07	x	0.00	x	1	x	365	x	64	]	/	[	70	x	23,360	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization
Adult Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.16E-02	x	0.00E+00	=	0.00E+00	2.36E-02	/	1.00E+00	=	2.36E-02
Antimony	7.60E-07	x	0.00E+00	=	0.00E+00	8.31E-07	/	4.00E-04	=	2.08E-03
Arsenic	1.83E-05	x	1.50E+00	=	2.74E-05	2.00E-05	/	3.00E-04	=	6.67E-02
Barium	2.53E-04	x	0.00E+00	=	0.00E+00	2.77E-04	/	2.00E-01	=	1.38E-03
Beryllium	6.14E-07	x	0.00E+00	=	0.00E+00	6.71E-07	/	2.00E-03	=	3.36E-04
Boron	1.68E-05	x	0.00E+00	=	0.00E+00	1.83E-05	/	2.00E-01	=	9.17E-05
Chromium	2.61E-05	x	0.00E+00	=	0.00E+00	2.86E-05	/	3.00E-03	=	9.52E-03
Cobalt	2.28E-05	x	0.00E+00	=	0.00E+00	2.49E-05	/	3.00E-04	=	8.31E-02
Copper	3.45E-05	x	0.00E+00	=	0.00E+00	3.77E-05	/	4.00E-02	=	9.43E-04
Fluoride	5.28E-06	x	0.00E+00	=	0.00E+00	5.77E-06	/	4.00E-02	=	1.44E-04
Iron	6.03E-02	x	0.00E+00	=	0.00E+00	6.60E-02	/	7.00E-01	=	9.43E-02
Lithium	2.41E-05	x	0.00E+00	=	0.00E+00	2.64E-05	/	2.00E-03	=	1.32E-02
Manganese	9.51E-04	x	0.00E+00	=	0.00E+00	1.04E-03	/	1.40E-01	=	7.43E-03
Mercury	5.38E-08	x	0.00E+00	=	0.00E+00	5.89E-08	/	0.00E+00	=	NA
Molybdenum	6.61E-06	x	0.00E+00	=	0.00E+00	7.23E-06	/	5.00E-03	=	1.45E-03
Nickel	2.56E-05	x	0.00E+00	=	0.00E+00	2.80E-05	/	2.00E-02	=	1.40E-03
Nitrate	2.22E-05	x	0.00E+00	=	0.00E+00	2.43E-05	/	7.10E+00	=	3.42E-06
Nitrite	5.72E-06	x	0.00E+00	=	0.00E+00	6.26E-06	/	3.00E-01	=	2.09E-05
Selenium	5.22E-06	x	0.00E+00	=	0.00E+00	5.71E-06	/	5.00E-03	=	1.14E-03
Strontium	1.30E-04	x	0.00E+00	=	0.00E+00	1.42E-04	/	6.00E-01	=	2.36E-04
Total Uranium	1.61E-06	x	0.00E+00	=	0.00E+00	1.76E-06	/	3.00E-03	=	5.88E-04
Vanadium	1.36E-04	x	0.00E+00	=	0.00E+00	1.48E-04	/	5.00E-03	=	2.97E-02
Zinc	1.18E-04	x	0.00E+00	=	0.00E+00	1.29E-04	/	3.00E-01	=	4.31E-04
Acetone	1.61E-08	x	0.00E+00	=	0.00E+00	1.77E-08	/	9.00E-01	=	1.96E-08
Benzene	8.57E-10	x	5.50E-02	=	4.71E-11	9.37E-10	/	4.00E-03	=	2.34E-07
Styrene	9.85E-10	x	0.00E+00	=	0.00E+00	1.08E-09	/	2.00E-01	=	5.39E-09
Toluene	1.93E-09	x	0.00E+00	=	0.00E+00	2.11E-09	/	8.00E-02	=	2.64E-08
			Pathway total	=	2.74E-05			Pathway total	=	3.38E-01

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	1.04E-04	x		=	NA	1.13E-04	/[	5.00E-03	x	1000	]=	2.27E-05
Antimony	3.64E-09	x		=	NA	3.99E-09	/[		x	1000	]=	NA
Arsenic	8.77E-08	x	4.30E-03	=	3.77E-10	9.59E-08	/[	1.50E-05	x	1000	]=	6.39E-06
Barium	1.21E-06	x		=	NA	1.33E-06	/[	5.00E-04	x	1000	]=	2.65E-06
Beryllium	2.94E-09	x	2.40E-03	=	7.06E-12	3.22E-09	/[	2.00E-05	x	1000	]=	1.61E-07
Boron	8.04E-08	x	0.00E+00	=	0.00E+00	8.79E-08	/[	2.00E-02	x	1000	]=	4.40E-09
Chromium	1.25E-07	x	8.40E-02	=	1.05E-08	1.37E-07	/[	1.00E-04	x	1000	]=	1.37E-06
Cobalt	1.09E-07	x	9.00E-03	=	9.84E-10	1.20E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	1.65E-07	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	2.53E-08	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	2.89E-04	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	1.16E-07	x		=	NA	1.27E-07	/[		x	1000	]=	NA
Manganese	4.56E-06	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.97E-05
Mercury	2.58E-10	x	0.00E+00	=	0.00E+00	2.82E-10	/[	3.00E-04	x	1000	]=	9.41E-10
Molybdenum	3.17E-08	x	0.00E+00	=	0.00E+00	3.47E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.23E-07	x	2.60E-04	=	3.19E-11	1.34E-07	/[	9.00E-05	x	1000	]=	1.49E-06
Nitrate	1.07E-07	x		=	NA	1.17E-07	/[		x	1000	]=	NA
Nitrite	2.74E-08	x		=	NA	3.00E-08	/[		x	1000	]=	NA
Selenium	2.50E-08	x	0.00E+00	=	0.00E+00	2.74E-08	/[	2.00E-02	x	1000	]=	1.37E-09
Strontium	6.21E-07	x		=	NA	6.79E-07	/[		x	1000	]=	NA
Total Uranium	7.73E-09	x		=	NA	8.46E-09	/[	4.00E-05	x	1000	]=	2.11E-07
Vanadium	6.50E-07	x		=	NA	7.11E-07	/[	1.00E-04	x	1000	]=	7.11E-06
Zinc	5.67E-07	x		=	NA	6.21E-07	/[		x	1000	]=	NA
Acetone	7.74E-11	x	0.00E+00	=	0.00E+00	8.47E-11	/[	3.10E+01	x	1000	]=	2.73E-15
Benzene	4.11E-12	x	7.80E-06	=	3.20E-17	4.49E-12	/[	3.00E-02	x	1000	]=	1.50E-13
Styrene	4.72E-12	x	0.00E+00	=	0.00E+00	5.16E-12	/[	1.00E+00	x	1000	]=	5.16E-15
Toluene	9.24E-12	x	0.00E+00	=	0.00E+00	1.01E-11	/[	5.00E+00	x	1000	]=	2.02E-15
			Pathway total =		1.19E-08					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	1.09E-06	x	1.50E+00	=	1.64E-06	1.20E-06	/	3.00E-04	=	3.99E-03
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		1.64E-06			Pathway total =		3.99E-03

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects		
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-02
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-03
Arsenic	Sum of all pathways	=	2.91E-05	100%	Sum of all pathways	=	7.1E-02
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03
Beryllium	Sum of all pathways	=	7.06E-12		Sum of all pathways	=	3.4E-04
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	9.2E-05
Chromium	Sum of all pathways	=	1.05E-08		Sum of all pathways	=	9.5E-03
Cobalt	Sum of all pathways	=	9.84E-10		Sum of all pathways	=	8.3E-02
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.4E-04
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-04
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	9.4E-02
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	7.5E-03
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	9.4E-10
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03
Nickel	Sum of all pathways	=	3.19E-11		Sum of all pathways	=	1.4E-03
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.4E-06
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-05
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-03
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	2.4E-04
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.9E-04
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-02
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.0E-08
Benzene	Sum of all pathways	=	4.71E-11		Sum of all pathways	=	2.3E-07
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	5.4E-09
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.6E-08

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.91E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	3.42E-01

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Adult Yakama Resident

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	1E-05	8E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	3E-05
Inhalation	1E-08	2E-08	2E-08	1E-08	2E-08	1E-08	1E-08	1E-08	1E-08	1E-08
Dermal Contact	9E-07	5E-06	1E-06	9E-07	1E-06	2E-06	9E-07	1E-06	1E-06	2E-06
ELCR	2E-05	9E-05	2E-05	1E-05	2E-05	3E-05	2E-05	2E-05	2E-05	3E-05
Risk Contributors	**None**									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	0.3	0.5	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Inhalation	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04
Dermal Contact	2E-03	1E-02	4E-03	2E-03	3E-03	5E-03	2E-03	3E-03	4E-03	4E-03
HI	0.3	0.6	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Hazard Contributors	**None**									

Appendix C

Attachment C-13: Results of Nonradiological Risk Assessment under Yakama Residential Child Receptor Scenario

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.62E-02	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.69E-07	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	8.04E-06	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.82E-04	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.07E-07	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.04E-05	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.95E-05	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.73E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	4.77E-06	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.16E-02	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.79E-05	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	7.59E-04	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.32E-05	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.94E-05	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	1.98E-06	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.03E-07	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	8.09E-05	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Tin	2.49E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.24E-06	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.29E-04	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	9.77E-05	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Diethylphthalate	7.29E-07	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1254	1.62E-08	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.89E-01	=	[	7.55E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	6.63E-06	=	[	2.65E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	9.38E-05	=	[	3.75E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.13E-03	=	[	8.50E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	2.42E-06	=	[	9.67E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.38E-04	=	[	9.54E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.27E-04	=	[	9.09E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.19E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	5.56E-05	=	[	2.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.02E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.08E-04	=	[	8.33E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	8.85E-03	=	[	3.54E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	2.71E-04	=	[	1.08E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	2.27E-04	=	[	9.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	2.31E-05	=	[	9.25E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	1.21E-06	=	[	4.83E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	9.43E-04	=	[	3.77E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Tin	2.90E-04	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.44E-05	=	[	5.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.50E-03	=	[	6.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.14E-03	=	[	4.56E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Diethylphthalate	8.50E-06	=	[	3.40E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1254	1.88E-07	=	[	7.54E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil - Exposure Area A plus B
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.86E-06	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.12E-10	=	[	3.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.40E-09	=	[	5.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.98E-08	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.14E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.12E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.07E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.50E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.61E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.83E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.78E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.16E-07	=	[	4.8E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.27E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.06E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.09E-09	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	5.67E-11	=	[	6.6E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.43E-08	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.36E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.78E-10	=	[	7.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.04E-08	=	[	8.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.35E-08	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Diethylphthalate	3.99E-10	=	[	4.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1254	8.85E-12	=	[	1.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.03E-04	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.63E-09	=	[	3.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	5.14E-08	=	[	5.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.16E-06	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.33E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.31E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.25E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.05E-08	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.14E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.85E-06	=	[	4.8E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.49E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.27E-08	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	6.61E-10	=	[	6.6E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	5.17E-07	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.91E-09	=	[	7.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.22E-07	=	[	8.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.25E-07	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Diethylphthalate	4.66E-09	=	[	4.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1254	1.03E-10	=	[	1.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	3.38E-07	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.90E-10	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Diethylphthalate	1.02E-07	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1254	3.17E-09	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.55E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.65E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	3.94E-06	=	[	3.75E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	8.50E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.39E-09	=	[	9.67E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	9.54E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	9.09E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	2.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	8.33E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.54E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.08E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	9.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	9.25E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	4.83E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.77E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Tin	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	5.77E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	6.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	4.56E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Diethylphthalate	1.19E-06	=	[	3.40E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1254	3.69E-08	=	[	7.54E-03	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area A plus B
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.62E-02	x	0.00E+00	=	0.00E+00	1.89E-01	/	1.00E+00	=	1.89E-01
Antimony	5.69E-07	x	0.00E+00	=	0.00E+00	6.63E-06	/	4.00E-04	=	1.66E-02
Arsenic	8.04E-06	x	1.50E+00	=	1.21E-05	9.38E-05	/	3.00E-04	=	3.13E-01
Barium	1.82E-04	x	0.00E+00	=	0.00E+00	2.13E-03	/	2.00E-01	=	1.06E-02
Cadmium	2.07E-07	x	0.00E+00	=	0.00E+00	2.42E-06	/	1.00E-03	=	2.42E-03
Chromium	2.04E-05	x	0.00E+00	=	0.00E+00	2.38E-04	/	3.00E-03	=	7.95E-02
Cobalt	1.95E-05	x	0.00E+00	=	0.00E+00	2.27E-04	/	3.00E-04	=	7.58E-01
Copper	2.73E-05	x	0.00E+00	=	0.00E+00	3.19E-04	/	4.00E-02	=	7.97E-03
Fluoride	4.77E-06	x	0.00E+00	=	0.00E+00	5.56E-05	/	4.00E-02	=	1.39E-03
Iron	5.16E-02	x	0.00E+00	=	0.00E+00	6.02E-01	/	7.00E-01	=	8.60E-01
Lithium	1.79E-05	x	0.00E+00	=	0.00E+00	2.08E-04	/	2.00E-03	=	1.04E-01
Manganese	7.59E-04	x	0.00E+00	=	0.00E+00	8.85E-03	/	1.40E-01	=	6.32E-02
Nickel	2.32E-05	x	0.00E+00	=	0.00E+00	2.71E-04	/	2.00E-02	=	1.36E-02
Nitrate	1.94E-05	x	0.00E+00	=	0.00E+00	2.27E-04	/	7.10E+00	=	3.19E-05
Nitrite	1.98E-06	x	0.00E+00	=	0.00E+00	2.31E-05	/	3.00E-01	=	7.71E-05
Silver	1.03E-07	x	0.00E+00	=	0.00E+00	1.21E-06	/	5.00E-03	=	2.41E-04
Strontium	8.09E-05	x	0.00E+00	=	0.00E+00	9.43E-04	/	6.00E-01	=	1.57E-03
Tin	2.49E-05	x	0.00E+00	=	0.00E+00	2.90E-04	/	6.00E-01	=	4.83E-04
Total Uranium	1.24E-06	x	0.00E+00	=	0.00E+00	1.44E-05	/	3.00E-03	=	4.81E-03
Vanadium	1.29E-04	x	0.00E+00	=	0.00E+00	1.50E-03	/	5.00E-03	=	3.00E-01
Zinc	9.77E-05	x	0.00E+00	=	0.00E+00	1.14E-03	/	3.00E-01	=	3.80E-03
Diethylphthalate	7.29E-07	x	0.00E+00	=	0.00E+00	8.50E-06	/	8.00E-01	=	1.06E-05
Aroclor-1254	1.62E-08	x	2.00E+00	=	3.23E-08	1.88E-07	/	2.00E-05	=	9.42E-03
			Pathway total	=	1.21E-05			Pathway total	=	2.74E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.86E-06	x		=	NA	1.03E-04	/[	5.00E-03	x	1000	]=	2.07E-05
Antimony	3.12E-10	x		=	NA	3.63E-09	/[		x	1000	]=	NA
Arsenic	4.40E-09	x	4.30E-03	=	1.89E-11	5.14E-08	/[	1.50E-05	x	1000	]=	3.43E-06
Barium	9.98E-08	x		=	NA	1.16E-06	/[	5.00E-04	x	1000	]=	2.33E-06
Cadmium	1.14E-10	x	1.80E-03	=	2.04E-13	1.33E-09	/[	1.00E-05	x	1000	]=	1.33E-07
Chromium	1.12E-08	x	8.40E-02	=	9.41E-10	1.31E-07	/[	1.00E-04	x	1000	]=	1.31E-06
Cobalt	1.07E-08	x	9.00E-03	=	9.61E-11	1.25E-07	/[	6.00E-06	x	1000	]=	2.08E-05
Copper	1.50E-08	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	2.61E-09	x		=	NA	3.05E-08	/[	1.30E-02	x	1000	]=	2.34E-09
Iron	2.83E-05	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	9.78E-09	x		=	NA	1.14E-07	/[		x	1000	]=	NA
Manganese	4.16E-07	x		=	NA	4.85E-06	/[	5.00E-05	x	1000	]=	9.70E-05
Nickel	1.27E-08	x	2.60E-04	=	3.31E-12	1.49E-07	/[	9.00E-05	x	1000	]=	1.65E-06
Nitrate	1.06E-08	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Nitrite	1.09E-09	x		=	NA	1.27E-08	/[		x	1000	]=	NA
Silver	5.67E-11	x		=	NA	6.61E-10	/[		x	1000	]=	NA
Strontium	4.43E-08	x		=	NA	5.17E-07	/[		x	1000	]=	NA
Tin	1.36E-08	x		=	NA	1.59E-07	/[		x	1000	]=	NA
Total Uranium	6.78E-10	x		=	NA	7.91E-09	/[	4.00E-05	x	1000	]=	1.98E-07
Vanadium	7.04E-08	x		=	NA	8.22E-07	/[	1.00E-04	x	1000	]=	8.22E-06
Zinc	5.35E-08	x		=	NA	6.25E-07	/[		x	1000	]=	NA
Diethylphthalate	3.99E-10	x		=	NA	4.66E-09	/[		x	1000	]=	NA
Aroclor-1254	8.85E-12	x	5.70E-04	=	5.05E-15	1.03E-10	/[		x	1000	]=	NA
			Pathway total =		1.06E-09					Pathway total =		1.56E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.38E-07	x	1.50E+00	=	5.06E-07	3.94E-06	/	3.00E-04	=	1.31E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Cadmium	2.90E-10	x		=	NA	3.39E-09	/	2.50E-05	=	1.35E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Diethylphthalate	1.02E-07	x		=	NA	1.19E-06	/	8.00E-01	=	1.49E-06
Aroclor-1254	3.17E-09	x	2.00E+00	=	6.33E-09	3.69E-08	/	2.00E-05	=	1.85E-03
			Pathway total =		5.13E-07			Pathway total =		1.51E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.9E-01**	7%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02	1%
Arsenic	Sum of all pathways	=	1.26E-05	Sum of all pathways	=	**3.3E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.1E-02	0%
Cadmium	Sum of all pathways	=	2.04E-13	Sum of all pathways	=	2.6E-03	0%
Chromium	Sum of all pathways	=	9.41E-10	Sum of all pathways	=	**7.9E-02**	3%
Cobalt	Sum of all pathways	=	9.61E-11	Sum of all pathways	=	**7.6E-01**	28%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	8.0E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-03	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**8.6E-01**	31%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**1.0E-01**	4%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**6.3E-02**	2%
Nickel	Sum of all pathways	=	3.31E-12	Sum of all pathways	=	1.4E-02	0%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	7.7E-05	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	2.4E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-03	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	4.8E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.0E-01**	11%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.8E-03	0%
Diethylphthalate	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-05	0%
Aroclor-1254	Sum of all pathways	=	3.86E-08	Sum of all pathways	=	1.1E-02	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.26E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	2.75E+00

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	2.04E-02	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	1.55E-06	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	4.54E-05	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	2.12E-04	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	8.64E-07	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	3.21E-07	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.74E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	2.36E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	3.88E-05	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	4.91E-06	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	6.13E-02	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	2.59E-05	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	9.62E-04	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	1.08E-08	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.79E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	3.73E-05	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	4.52E-06	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.71E-07	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	9.58E-05	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.81E-06	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.68E-04	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	1.10E-04	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.73E-07	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.38E-01	=	[	9.51E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	1.80E-05	=	[	7.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	5.30E-04	=	[	2.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.47E-03	=	[	9.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	1.01E-05	=	[	4.03E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.75E-06	=	[	1.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	3.20E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.75E-04	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	4.53E-04	=	[	1.81E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	5.73E-05	=	[	2.29E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	7.15E-01	=	[	2.86E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	3.03E-04	=	[	1.21E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	1.12E-02	=	[	4.49E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	1.27E-07	=	[	5.06E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	3.25E-04	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	4.35E-04	=	[	1.74E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	5.28E-05	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	2.00E-06	=	[	8.00E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	1.12E-03	=	[	4.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	2.11E-05	=	[	8.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.96E-03	=	[	7.85E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.28E-03	=	[	5.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	2.02E-06	=	[	8.07E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	1.12E-05	=	[	1.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	8.47E-10	=	[	9.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	2.49E-08	=	[	2.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.16E-07	=	[	1.4E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	4.73E-10	=	[	5.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.76E-10	=	[	2.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.50E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.29E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	2.13E-08	=	[	2.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.69E-09	=	[	3.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.36E-05	=	[	3.9E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.42E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.27E-07	=	[	6.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	5.94E-12	=	[	6.9E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.53E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	2.04E-08	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.48E-09	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.39E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.25E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.93E-10	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	9.22E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	6.00E-08	=	[	7.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.48E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.30E-04	=	[	1.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	9.88E-09	=	[	9.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	2.90E-07	=	[	2.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.35E-06	=	[	1.4E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	5.52E-09	=	[	5.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	2.05E-09	=	[	2.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.75E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.48E-07	=	[	2.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.14E-08	=	[	3.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.92E-04	=	[	3.9E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.66E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	6.15E-06	=	[	6.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	6.93E-11	=	[	6.9E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	2.38E-07	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.10E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	6.12E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.16E-08	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	7.00E-07	=	[	7.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.11E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Arsenic	2.04E-06	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cadmium	4.80E-10	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	25,550	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	25,550	]
Butylbenzylphthalate	2.58E-08	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	9.51E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Antimony	NA	=	[	7.21E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Arsenic	2.37E-05	=	[	2.12E+01	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Barium	NA	=	[	9.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Beryllium	0.00E+00	=	[	4.03E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cadmium	5.60E-09	=	[	1.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Chromium	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Cobalt	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Copper	NA	=	[	1.81E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Fluoride	NA	=	[	2.29E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Iron	NA	=	[	2.86E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Lithium	NA	=	[	1.21E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Manganese	NA	=	[	4.49E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Mercury	0.00E+00	=	[	5.06E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nickel	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrate	NA	=	[	1.74E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Nitrite	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Silver	NA	=	[	8.00E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Strontium	NA	=	[	4.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Total Uranium	0.00E+00	=	[	8.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	15	x	2,190	]
Vanadium	NA	=	[	7.85E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Zinc	NA	=	[	5.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	15	x	2,190	]
Butylbenzylphthalate	3.01E-07	=	[	8.07E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	15	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

RPP-RPT-58329, Rev. 3

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area C
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	2.04E-02	x	0.00E+00	=	0.00E+00	2.38E-01	/	1.00E+00	=	2.38E-01
Antimony	1.55E-06	x	0.00E+00	=	0.00E+00	1.80E-05	/	4.00E-04	=	4.51E-02
Arsenic	4.54E-05	x	1.50E+00	=	6.81E-05	5.30E-04	/	3.00E-04	=	1.77E+00
Barium	2.12E-04	x	0.00E+00	=	0.00E+00	2.47E-03	/	2.00E-01	=	1.24E-02
Beryllium	8.64E-07	x	0.00E+00	=	0.00E+00	1.01E-05	/	2.00E-03	=	5.04E-03
Cadmium	3.21E-07	x	0.00E+00	=	0.00E+00	3.75E-06	/	1.00E-03	=	3.75E-03
Chromium	2.74E-05	x	0.00E+00	=	0.00E+00	3.20E-04	/	3.00E-03	=	1.07E-01
Cobalt	2.36E-05	x	0.00E+00	=	0.00E+00	2.75E-04	/	3.00E-04	=	9.17E-01
Copper	3.88E-05	x	0.00E+00	=	0.00E+00	4.53E-04	/	4.00E-02	=	1.13E-02
Fluoride	4.91E-06	x	0.00E+00	=	0.00E+00	5.73E-05	/	4.00E-02	=	1.43E-03
Iron	6.13E-02	x	0.00E+00	=	0.00E+00	7.15E-01	/	7.00E-01	=	1.02E+00
Lithium	2.59E-05	x	0.00E+00	=	0.00E+00	3.03E-04	/	2.00E-03	=	1.51E-01
Manganese	9.62E-04	x	0.00E+00	=	0.00E+00	1.12E-02	/	1.40E-01	=	8.02E-02
Mercury	1.08E-08	x	0.00E+00	=	0.00E+00	1.27E-07	/	0.00E+00	=	NA
Nickel	2.79E-05	x	0.00E+00	=	0.00E+00	3.25E-04	/	2.00E-02	=	1.63E-02
Nitrate	3.73E-05	x	0.00E+00	=	0.00E+00	4.35E-04	/	7.10E+00	=	6.13E-05
Nitrite	4.52E-06	x	0.00E+00	=	0.00E+00	5.28E-05	/	3.00E-01	=	1.76E-04
Silver	1.71E-07	x	0.00E+00	=	0.00E+00	2.00E-06	/	5.00E-03	=	4.00E-04
Strontium	9.58E-05	x	0.00E+00	=	0.00E+00	1.12E-03	/	6.00E-01	=	1.86E-03
Total Uranium	1.81E-06	x	0.00E+00	=	0.00E+00	2.11E-05	/	3.00E-03	=	7.05E-03
Vanadium	1.68E-04	x	0.00E+00	=	0.00E+00	1.96E-03	/	5.00E-03	=	3.93E-01
Zinc	1.10E-04	x	0.00E+00			1.28E-03	/	3.00E-01	=	4.26E-03
Butylbenzylphthalate	1.73E-07	x	1.90E-03	=	3.29E-10	2.02E-06	/	2.00E-01	=	1.01E-05
			Pathway total	=	6.81E-05			Pathway total	=	4.78E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	1.12E-05	x		=	NA	1.30E-04	/[	5.00E-03	x	1000	]=	2.61E-05
Antimony	8.47E-10	x		=	NA	9.88E-09	/[		x	1000	]=	NA
Arsenic	2.49E-08	x	4.30E-03	=	1.07E-10	2.90E-07	/[	1.50E-05	x	1000	]=	1.94E-05
Barium	1.16E-07	x		=	NA	1.35E-06	/[	5.00E-04	x	1000	]=	2.71E-06
Beryllium	4.73E-10	x	2.40E-03	=	1.14E-12	5.52E-09	/[	2.00E-05	x	1000	]=	2.76E-07
Cadmium	1.76E-10	x	1.80E-03	=	3.17E-13	2.05E-09	/[	1.00E-05	x	1000	]=	2.05E-07
Chromium	1.50E-08	x	8.40E-02	=	1.26E-09	1.75E-07	/[	1.00E-04	x	1000	]=	1.75E-06
Cobalt	1.29E-08	x	9.00E-03	=	1.16E-10	1.51E-07	/[	6.00E-06	x	1000	]=	2.51E-05
Copper	2.13E-08	x		=	NA	2.48E-07	/[		x	1000	]=	NA
Fluoride	2.69E-09	x		=	NA	3.14E-08	/[	1.30E-02	x	1000	]=	2.41E-09
Iron	3.36E-05	x		=	NA	3.92E-04	/[		x	1000	]=	NA
Lithium	1.42E-08	x		=	NA	1.66E-07	/[		x	1000	]=	NA
Manganese	5.27E-07	x		=	NA	6.15E-06	/[	5.00E-05	x	1000	]=	1.23E-04
Mercury	5.94E-12	x	0.00E+00	=	0.00E+00	6.93E-11	/[	3.00E-04	x	1000	]=	2.31E-10
Nickel	1.53E-08	x	2.60E-04	=	3.97E-12	1.78E-07	/[	9.00E-05	x	1000	]=	1.98E-06
Nitrate	2.04E-08	x		=	NA	2.38E-07	/[		x	1000	]=	NA
Nitrite	2.48E-09	x		=	NA	2.89E-08	/[		x	1000	]=	NA
Silver	9.39E-11	x		=	NA	1.10E-09	/[		x	1000	]=	NA
Strontium	5.25E-08	x		=	NA	6.12E-07	/[		x	1000	]=	NA
Total Uranium	9.93E-10	x		=	NA	1.16E-08	/[	4.00E-05	x	1000	]=	2.90E-07
Vanadium	9.22E-08	x		=	NA	1.08E-06	/[	1.00E-04	x	1000	]=	1.08E-05
Zinc	6.00E-08	x				7.00E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	9.48E-11	x	0.00E+00	=	0.00E+00	1.11E-09	/[		x	1000	]=	NA
			Pathway total =		1.49E-09					Pathway total =		2.12E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	2.04E-06	x	1.50E+00	=	3.05E-06	2.37E-05	/	3.00E-04	=	7.91E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.80E-10	x		=	NA	5.60E-09	/	2.50E-05	=	2.24E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x				NA	/	3.00E-01	=	NA
Butylbenzylphthalate	2.58E-08	x	1.90E-03	=	4.91E-11	3.01E-07	/	2.00E-01	=	1.51E-06
			Pathway total =		3.05E-06			Pathway total =		7.94E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Co	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.4E-01**	5%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-02	1%
Arsenic	Sum of all pathways	=	7.12E-05	100%	Sum of all pathways	=	**1.8E+00**	38%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02	0%
Beryllium	Sum of all pathways	=	1.14E-12	0%	Sum of all pathways	=	5.0E-03	0%
Cadmium	Sum of all pathways	=	3.17E-13	0%	Sum of all pathways	=	4.0E-03	0%
Chromium	Sum of all pathways	=	1.26E-09	0%	Sum of all pathways	=	**1.1E-01**	2%
Cobalt	Sum of all pathways	=	1.16E-10	0%	Sum of all pathways	=	**9.2E-01**	19%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**1.0E+00**	21%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.5E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**8.0E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-10	0%
Nickel	Sum of all pathways	=	3.97E-12	0%	Sum of all pathways	=	1.6E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	6.1E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	7.0E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.9E-01**	8%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	3.78E-10	0%	Sum of all pathways	=	1.2E-05	1%

Total Carcinogenic Risk All Pathways and Chemicals	=	**7.12E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**4.86E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.59E-02	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	3.81E-07	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.11E-05	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.68E-04	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	3.41E-07	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Boron	7.16E-06	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	6.99E-06	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	3.69E-05	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.89E-05	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	3.54E-05	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	3.17E-06	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.19E-02	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.96E-05	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	1.06E-03	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	4.97E-08	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.66E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.08E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	3.00E-06	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	1.20E-06	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.82E-07	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	7.44E-05	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.77E-06	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.26E-04	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	9.60E-05	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	1.42E-08	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	2.66E-07	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	7.22E-10	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Aldrin	4.29E-09	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.86E-01	=	[	7.42E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	4.45E-06	=	[	1.78E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.30E-04	=	[	5.20E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	1.96E-03	=	[	7.84E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	3.98E-06	=	[	1.59E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Boron	8.35E-05	=	[	3.34E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	8.15E-05	=	[	3.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	4.30E-04	=	[	1.72E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.21E-04	=	[	8.82E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	4.13E-04	=	[	1.65E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	3.70E-05	=	[	1.48E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.05E-01	=	[	2.42E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.28E-04	=	[	9.13E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	1.24E-02	=	[	4.95E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	5.80E-07	=	[	2.32E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	3.10E-04	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	1.26E-04	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	3.50E-05	=	[	1.40E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	1.40E-05	=	[	5.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	2.13E-06	=	[	8.50E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	8.68E-04	=	[	3.47E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	2.07E-05	=	[	8.27E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.47E-03	=	[	5.88E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.12E-03	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	1.66E-07	=	[	6.63E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	3.10E-06	=	[	1.24E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	8.43E-09	=	[	3.37E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Aldrin	5.00E-08	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.71E-06	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.09E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	6.11E-09	=	[	7.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.21E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.87E-10	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	3.92E-09	=	[	4.6E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	3.83E-09	=	[	4.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	2.02E-08	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.04E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.94E-08	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.74E-09	=	[	2.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.84E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.07E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	5.81E-07	=	[	6.8E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.72E-11	=	[	3.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.46E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	5.89E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.64E-09	=	[	1.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	6.58E-10	=	[	7.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.98E-11	=	[	1.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.07E-08	=	[	4.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	9.71E-10	=	[	1.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.90E-08	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.26E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.78E-12	=	[	9.1E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.46E-10	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.96E-13	=	[	4.6E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aldrin	2.35E-12	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	= [	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3		ug/m^3		days/year		hrs/day		years				days		hrs/day	

NONCARCINOGENIC EFFECTS

Aluminum	1.02E-04	=	[	1.0E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.44E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	7.12E-08	=	[	7.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.18E-09	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	4.58E-08	=	[	4.6E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.47E-08	=	[	4.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.36E-07	=	[	2.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.21E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.26E-07	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.03E-08	=	[	2.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.32E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	6.78E-06	=	[	6.8E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	3.18E-10	=	[	3.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.92E-08	=	[	1.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	7.67E-09	=	[	7.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.16E-09	=	[	1.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.75E-07	=	[	4.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	1.13E-08	=	[	1.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.05E-07	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.14E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	9.08E-11	=	[	9.1E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.70E-09	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	4.62E-12	=	[	4.6E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aldrin	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	4.68E-07	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	9.78E-09	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	3.72E-08	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Aldrin	6.00E-10	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.42E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	1.78E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	5.46E-06	=	[	5.20E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	7.84E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	1.59E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Boron	0.00E+00	=	[	3.34E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	1.14E-07	=	[	3.26E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.72E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	8.82E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.65E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	1.48E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.42E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	9.13E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	4.95E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	2.32E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	1.40E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	0.00E+00	=	[	5.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	8.50E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.47E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	8.27E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	5.88E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	0.00E+00	=	[	6.63E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	4.34E-07	=	[	1.24E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	3.37E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Aldrin	7.00E-09	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area E
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.59E-02	x	0.00E+00	=	0.00E+00	1.86E-01	/	1.00E+00	=	1.86E-01
Antimony	3.81E-07	x	0.00E+00	=	0.00E+00	4.45E-06	/	4.00E-04	=	1.11E-02
Arsenic	1.11E-05	x	1.50E+00	=	1.67E-05	1.30E-04	/	3.00E-04	=	4.33E-01
Barium	1.68E-04	x	0.00E+00	=	0.00E+00	1.96E-03	/	2.00E-01	=	9.80E-03
Beryllium	3.41E-07	x	0.00E+00	=	0.00E+00	3.98E-06	/	2.00E-03	=	1.99E-03
Boron	7.16E-06	x	0.00E+00	=	0.00E+00	8.35E-05	/	2.00E-01	=	4.18E-04
Cadmium	6.99E-06	x	0.00E+00	=	0.00E+00	8.15E-05	/	1.00E-03	=	8.15E-02
Chromium	3.69E-05	x	0.00E+00	=	0.00E+00	4.30E-04	/	3.00E-03	=	1.43E-01
Cobalt	1.89E-05	x	0.00E+00	=	0.00E+00	2.21E-04	/	3.00E-04	=	7.35E-01
Copper	3.54E-05	x	0.00E+00	=	0.00E+00	4.13E-04	/	4.00E-02	=	1.03E-02
Fluoride	3.17E-06	x	0.00E+00	=	0.00E+00	3.70E-05	/	4.00E-02	=	9.25E-04
Iron	5.19E-02	x	0.00E+00	=	0.00E+00	6.05E-01	/	7.00E-01	=	8.64E-01
Lithium	1.96E-05	x	0.00E+00	=	0.00E+00	2.28E-04	/	2.00E-03	=	1.14E-01
Manganese	1.06E-03	x	0.00E+00	=	0.00E+00	1.24E-02	/	1.40E-01	=	8.84E-02
Mercury	4.97E-08	x	0.00E+00	=	0.00E+00	5.80E-07	/	0.00E+00	=	NA
Nickel	2.66E-05	x	0.00E+00	=	0.00E+00	3.10E-04	/	2.00E-02	=	1.55E-02
Nitrate	1.08E-05	x	0.00E+00	=	0.00E+00	1.26E-04	/	7.10E+00	=	1.77E-05
Nitrite	3.00E-06	x	0.00E+00	=	0.00E+00	3.50E-05	/	3.00E-01	=	1.17E-04
Selenium	1.20E-06	x	0.00E+00	=	0.00E+00	1.40E-05	/	5.00E-03	=	2.80E-03
Silver	1.82E-07	x	0.00E+00	=	0.00E+00	2.13E-06	/	5.00E-03	=	4.25E-04
Strontium	7.44E-05	x	0.00E+00	=	0.00E+00	8.68E-04	/	6.00E-01	=	1.45E-03
Total Uranium	1.77E-06	x	0.00E+00	=	0.00E+00	2.07E-05	/	3.00E-03	=	6.89E-03
Vanadium	1.26E-04	x	0.00E+00	=	0.00E+00	1.47E-03	/	5.00E-03	=	2.94E-01
Zinc	9.60E-05	x	0.00E+00	=	0.00E+00	1.12E-03	/	3.00E-01	=	3.73E-03
Acetone	1.42E-08	x	0.00E+00	=	0.00E+00	1.66E-07	/	9.00E-01	=	1.84E-07
Butylbenzylphthalate	2.66E-07	x	1.90E-03	=	5.05E-10	3.10E-06	/	2.00E-01	=	1.55E-05
Toluene	7.22E-10	x	0.00E+00	=	0.00E+00	8.43E-09	/	8.00E-02	=	1.05E-07
Aldrin	4.29E-09	x	1.70E+01	=	7.29E-08	5.00E-08	/	3.00E-05	=	1.67E-03
			Pathway total	=	1.68E-05			Pathway total	=	3.01E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.71E-06	x		=	NA	1.02E-04	/[	5.00E-03	x	1000	]=	2.03E-05
Antimony	2.09E-10	x		=	NA	2.44E-09	/[		x	1000	]=	NA
Arsenic	6.11E-09	x	4.30E-03	=	2.63E-11	7.12E-08	/[	1.50E-05	x	1000	]=	4.75E-06
Barium	9.21E-08	x		=	NA	1.07E-06	/[	5.00E-04	x	1000	]=	2.15E-06
Beryllium	1.87E-10	x	2.40E-03	=	4.48E-13	2.18E-09	/[	2.00E-05	x	1000	]=	1.09E-07
Boron	3.92E-09	x	0.00E+00	=	0.00E+00	4.58E-08	/[	2.00E-02	x	1000	]=	2.29E-09
Cadmium	3.83E-09	x	1.80E-03	=	6.89E-12	4.47E-08	/[	1.00E-05	x	1001	]=	4.46E-06
Chromium	2.02E-08	x	8.40E-02	=	1.70E-09	2.36E-07	/[	1.00E-04	x	1002	]=	2.35E-06
Cobalt	1.04E-08	x	9.00E-03	=	9.32E-11	1.21E-07	/[	6.00E-06	x	1003	]=	2.01E-05
Copper	1.94E-08	x		=	NA	2.26E-07	/[		x	1004	]=	NA
Fluoride	1.74E-09	x		=	NA	2.03E-08	/[	1.30E-02	x	1005	]=	1.55E-09
Iron	2.84E-05	x		=	NA	3.32E-04	/[		x	1000	]=	NA
Lithium	1.07E-08	x		=	NA	1.25E-07	/[		x	1000	]=	NA
Manganese	5.81E-07	x		=	NA	6.78E-06	/[	5.00E-05	x	1000	]=	1.36E-04
Mercury	2.72E-11	x	0.00E+00	=	0.00E+00	3.18E-10	/[	3.00E-04	x	1000	]=	1.06E-09
Nickel	1.46E-08	x	2.60E-04	=	3.79E-12	1.70E-07	/[	9.00E-05	x	1000	]=	1.89E-06
Nitrate	5.89E-09	x		=	NA	6.88E-08	/[		x	1000	]=	NA
Nitrite	1.64E-09	x		=	NA	1.92E-08	/[		x	1000	]=	NA
Selenium	6.58E-10	x	0.00E+00	=	0.00E+00	7.67E-09	/[	2.00E-02	x	1000	]=	3.84E-10
Silver	9.98E-11	x		=	NA	1.16E-09	/[		x	1000	]=	NA
Strontium	4.07E-08	x		=	NA	4.75E-07	/[		x	1000	]=	NA
Total Uranium	9.71E-10	x		=	NA	1.13E-08	/[	4.00E-05	x	1000	]=	2.83E-07
Vanadium	6.90E-08	x		=	NA	8.05E-07	/[	1.00E-04	x	1000	]=	8.05E-06
Zinc	5.26E-08	x		=	NA	6.14E-07	/[		x	1000	]=	NA
Acetone	7.78E-12	x	0.00E+00	=	0.00E+00	9.08E-11	/[	3.10E+01	x	1000	]=	2.93E-15
Butylbenzylphthalate	1.46E-10	x	0.00E+00	=	0.00E+00	1.70E-09	/[		x	1000	]=	NA
Toluene	3.96E-13	x	0.00E+00	=	0.00E+00	4.62E-12	/[	5.00E+00	x	1000	]=	9.23E-16
Aldrin	2.35E-12	x	4.90E-03	=	1.15E-14	2.74E-11	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.83E-09					Pathway total =		2.00E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.68E-07	x	1.50E+00	=	7.02E-07	5.46E-06	/	3.00E-04	=	1.82E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	9.78E-09	x		=	NA	1.14E-07	/	2.50E-05	=	4.56E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.72E-08	x	1.90E-03	=	7.07E-11	4.34E-07	/	2.00E-01	=	2.17E-06
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Aldrin	6.00E-10	x	1.70E+01	=	1.02E-08	7.00E-09	/	3.00E-05	=	2.33E-04
			Pathway total =		7.12E-07			Pathway total =		2.30E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.9E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Arsenic	Sum of all pathways	=	1.74E-05	100%	Sum of all pathways	=	**4.5E-01**	15%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	9.8E-03	0%
Beryllium	Sum of all pathways	=	4.48E-13	0%	Sum of all pathways	=	2.0E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	4.2E-04	0%
Cadmium	Sum of all pathways	=	6.89E-12	0%	Sum of all pathways	=	**8.6E-02**	3%
Chromium	Sum of all pathways	=	1.70E-09	0%	Sum of all pathways	=	**1.4E-01**	5%
Cobalt	Sum of all pathways	=	9.32E-11	0%	Sum of all pathways	=	**7.4E-01**	24%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-04	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**8.6E-01**	29%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.1E-01**	4%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**8.9E-02**	3%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-09	0%
Nickel	Sum of all pathways	=	3.79E-12	0%	Sum of all pathways	=	1.6E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	2.8E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	4.3E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	6.9E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**2.9E-01**	10%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-07	0%
Butylbenzylphthalate	Sum of all pathways	=	5.76E-10	0%	Sum of all pathways	=	1.8E-05	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-07	0%
Aldrin	Sum of all pathways	=	8.31E-08	0%	Sum of all pathways	=	1.9E-03	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.75E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.03E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.45E-02	=	[	6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.30E-07	=	[	2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	7.47E-06	=	[	3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	2.02E-04	=	[	9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	6.39E-07	=	[	2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.50E-07	=	[	1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	1.92E-05	=	[	8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.75E-05	=	[	8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.79E-05	=	[	1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	4.53E-06	=	[	2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.13E-02	=	[	2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.59E-05	=	[	7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	8.28E-04	=	[	3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	6.51E-08	=	[	3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.41E-05	=	[	1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.53E-05	=	[	7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	6.56E-06	=	[	3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.75E-07	=	[	8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	7.75E-05	=	[	3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Tin	1.36E-05	=	[	6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.53E-06	=	[	7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.49E-04	=	[	6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	8.21E-05	=	[	3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
2-Butanone	5.32E-09	=	[	2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	8.64E-06	=	[	4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.27E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Hexane	7.69E-08	=	[	3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	4.29E-09	=	[	2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
o-Xylene	2.74E-10	=	[	1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	1.40E-09	=	[	6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	2.10E-09	=	[	9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Xylenes (total)	9.92E-10	=	[	4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	5.41E-08	=	[	2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Gamma-BHC (Lindane)	1.09E-08	=	[	5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1260	4.41E-08	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																				
Aluminum	1.69E-01	=	[6.76E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	6.18E-06	=	[2.47E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	8.72E-05	=	[3.49E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.35E-03	=	[9.41E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	7.45E-06	=	[2.98E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	2.91E-06	=	[1.17E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.24E-04	=	[8.98E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.05E-04	=	[8.18E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.26E-04	=	[1.30E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	5.28E-05	=	[2.11E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	5.99E-01	=	[2.39E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	1.86E-04	=	[7.43E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	9.66E-03	=	[3.86E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	7.60E-07	=	[3.04E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	2.81E-04	=	[1.13E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	1.79E-04	=	[7.15E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	7.65E-05	=	[3.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	2.05E-06	=	[8.18E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	9.04E-04	=	[3.62E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Tin	1.59E-04	=	[6.36E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.79E-05	=	[7.15E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.74E-03	=	[6.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	9.58E-04	=	[3.83E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
2-Butanone	6.21E-08	=	[2.48E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	1.01E-04	=	[4.03E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	1.48E-06	=	[5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Hexane	8.98E-07	=	[3.59E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	5.00E-08	=	[2.00E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
o-Xylene	3.20E-09	=	[1.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	1.64E-08	=	[6.54E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	2.45E-08	=	[9.78E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Xylenes (total)	1.16E-08	=	[4.63E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	6.31E-07	=	[2.52E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Gamma-BHC (Lindane)	1.28E-07	=	[5.10E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1260	5.15E-07	=	[2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area F plus G
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.94E-06	=	[	9.3E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.90E-10	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.10E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.10E-07	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.50E-10	=	[	4.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.37E-10	=	[	1.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.05E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.61E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.53E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.48E-09	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.81E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.72E-09	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.54E-07	=	[	5.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	3.57E-11	=	[	4.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.32E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	8.40E-09	=	[	9.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.59E-09	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	9.60E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.25E-08	=	[	5.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	7.47E-09	=	[	8.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	8.40E-10	=	[	9.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	8.19E-08	=	[	9.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.50E-08	=	[	5.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Butanone	2.92E-12	=	[	3.4E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	4.73E-09	=	[	5.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.95E-11	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	4.22E-11	=	[	4.9E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	2.35E-12	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
o-Xylene	1.50E-13	=	[	1.8E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	7.68E-13	=	[	9.0E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	1.15E-12	=	[	1.3E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Xylenes (total)	5.44E-13	=	[	6.3E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.96E-11	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Gamma-BHC (Lindane)	5.99E-12	=	[	7.0E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	2.42E-11	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.26E-05	=	[	9.3E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.39E-09	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.78E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.29E-06	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	4.08E-09	=	[	4.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.60E-09	=	[	1.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.23E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.12E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.78E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.89E-08	=	[	2.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.28E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.02E-07	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.29E-06	=	[	5.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	4.16E-10	=	[	4.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.54E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	9.80E-08	=	[	9.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.19E-08	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.12E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.96E-07	=	[	5.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	8.71E-08	=	[	8.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.80E-09	=	[	9.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	9.55E-07	=	[	9.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.25E-07	=	[	5.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Butanone	3.40E-11	=	[	3.4E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	5.52E-08	=	[	5.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	4.92E-10	=	[	4.9E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	2.74E-11	=	[	2.7E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
o-Xylene	1.75E-12	=	[	1.8E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	8.96E-12	=	[	9.0E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	1.34E-11	=	[	1.3E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Xylenes (total)	6.34E-12	=	[	6.3E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.46E-10	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Gamma-BHC (Lindane)	6.99E-11	=	[	7.0E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	3.14E-07	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	3.50E-10	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	1.21E-06	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.78E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Xylenes (total)	0.00E+00	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	7.57E-09	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Gamma-BHC (Lindane)	6.12E-10	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1260	8.65E-09	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.76E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.47E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	3.66E-06	=	[	3.49E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	9.41E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	2.98E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	4.08E-09	=	[	1.17E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	8.98E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	8.18E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.30E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	2.11E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.39E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	7.43E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.86E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	3.04E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.13E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	7.15E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	3.06E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	8.18E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.62E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Tin	NA	=	[	6.36E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	7.15E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	6.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	3.83E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
2-Butanone	0.00E+00	=	[	2.48E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	1.41E-05	=	[	4.03E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	2.07E-07	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Hexane	0.00E+00	=	[	3.59E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	0.00E+00	=	[	2.00E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
o-Xylene	0.00E+00	=	[	1.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	0.00E+00	=	[	6.54E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	9.78E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Xylenes (total)	NA	=	[	4.63E-04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	8.83E-08	=	[	2.52E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Gamma-BHC (Lindane)	7.14E-09	=	[	5.10E-03	x	1.00E-06	x	2,800	x	0.2	x	0.04	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1260	1.01E-07	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area F plus G
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.45E-02	x	0.00E+00	=	0.00E+00	1.69E-01	/	1.00E+00	=	1.69E-01
Antimony	5.30E-07	x	0.00E+00	=	0.00E+00	6.18E-06	/	4.00E-04	=	1.54E-02
Arsenic	7.47E-06	x	1.50E+00	=	1.12E-05	8.72E-05	/	3.00E-04	=	2.91E-01
Barium	2.02E-04	x	0.00E+00	=	0.00E+00	2.35E-03	/	2.00E-01	=	1.18E-02
Beryllium	6.39E-07	x	0.00E+00	=	0.00E+00	7.45E-06	/	2.00E-03	=	3.73E-03
Cadmium	2.50E-07	x	0.00E+00	=	0.00E+00	2.91E-06	/	1.00E-03	=	2.91E-03
Chromium	1.92E-05	x	0.00E+00	=	0.00E+00	2.24E-04	/	3.00E-03	=	7.48E-02
Cobalt	1.75E-05	x	0.00E+00	=	0.00E+00	2.05E-04	/	3.00E-04	=	6.82E-01
Copper	2.79E-05	x	0.00E+00	=	0.00E+00	3.26E-04	/	4.00E-02	=	8.14E-03
Fluoride	4.53E-06	x	0.00E+00	=	0.00E+00	5.28E-05	/	4.00E-02	=	1.32E-03
Iron	5.13E-02	x	0.00E+00	=	0.00E+00	5.99E-01	/	7.00E-01	=	8.55E-01
Lithium	1.59E-05	x	0.00E+00	=	0.00E+00	1.86E-04	/	2.00E-03	=	9.28E-02
Manganese	8.28E-04	x	0.00E+00	=	0.00E+00	9.66E-03	/	1.40E-01	=	6.90E-02
Mercury	6.51E-08	x	0.00E+00	=	0.00E+00	7.60E-07	/	0.00E+00	=	NA
Nickel	2.41E-05	x	0.00E+00	=	0.00E+00	2.81E-04	/	2.00E-02	=	1.41E-02
Nitrate	1.53E-05	x	0.00E+00	=	0.00E+00	1.79E-04	/	7.10E+00	=	2.52E-05
Nitrite	6.56E-06	x	0.00E+00	=	0.00E+00	7.65E-05	/	3.00E-01	=	2.55E-04
Silver	1.75E-07	x	0.00E+00	=	0.00E+00	2.05E-06	/	5.00E-03	=	4.09E-04
Strontium	7.75E-05	x	0.00E+00	=	0.00E+00	9.04E-04	/	6.00E-01	=	1.51E-03
Tin	1.36E-05	x	0.00E+00	=	0.00E+00	1.59E-04	/	6.00E-01	=	2.65E-04
Total Uranium	1.53E-06	x	0.00E+00	=	0.00E+00	1.79E-05	/	3.00E-03	=	5.96E-03
Vanadium	1.49E-04	x	0.00E+00	=	0.00E+00	1.74E-03	/	5.00E-03	=	3.49E-01
Zinc	8.21E-05	x	0.00E+00	=	0.00E+00	9.58E-04	/	3.00E-01	=	3.19E-03
2-Butanone	5.32E-09	x	0.00E+00	=	0.00E+00	6.21E-08	/	6.00E-01	=	1.04E-07
Bis(2-ethylhexyl) phthalate	8.64E-06	x	1.40E-02	=	1.21E-07	1.01E-04	/	2.00E-02	=	5.04E-03
Butylbenzylphthalate	1.27E-07	x	1.90E-03	=	2.41E-10	1.48E-06	/	2.00E-01	=	7.40E-06
Hexane	7.69E-08	x	0.00E+00	=	0.00E+00	8.98E-07	/	6.00E-02	=	1.50E-05
Methylene chloride	4.29E-09	x	2.00E-03	=	8.57E-12	5.00E-08	/	6.00E-03	=	8.33E-06
o-Xylene	2.74E-10	x	0.00E+00	=	0.00E+00	3.20E-09	/	2.00E-01	=	1.60E-08
Styrene	1.40E-09	x	0.00E+00	=	0.00E+00	1.64E-08	/	2.00E-01	=	8.18E-08
Toluene	2.10E-09	x	0.00E+00	=	0.00E+00	2.45E-08	/	8.00E-02	=	3.06E-07
Xylenes (total)	9.92E-10	x	0.00E+00	=	0.00E+00	1.16E-08	/	2.00E-01	=	5.79E-08
beta-BHC	5.41E-08	x	1.80E+00	=	9.74E-08	6.31E-07	/	0.00E+00	=	NA
Gamma-BHC (Lindane)	1.09E-08	x	1.10E+00	=	1.20E-08	1.28E-07	/	3.00E-04	=	4.25E-04
Aroclor-1260	4.41E-08	x	2.00E+00	=	8.83E-08	5.15E-07	/	0.00E+00	=	NA
			Pathway total	=	1.15E-05			Pathway total	=	2.66E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	7.94E-06	x		=	NA	9.26E-05	/[	5.00E-03	x	1000	]=	1.85E-05
Antimony	2.90E-10	x		=	NA	3.39E-09	/[		x	1000	]=	NA
Arsenic	4.10E-09	x	4.30E-03	=	1.76E-11	4.78E-08	/[	1.50E-05	x	1000	]=	3.19E-06
Barium	1.10E-07	x		=	NA	1.29E-06	/[	5.00E-04	x	1000	]=	2.58E-06
Beryllium	3.50E-10	x	2.40E-03	=	8.40E-13	4.08E-09	/[	2.00E-05	x	1000	]=	2.04E-07
Cadmium	1.37E-10	x	1.80E-03	=	2.46E-13	1.60E-09	/[	1.00E-05	x	1000	]=	1.60E-07
Chromium	1.05E-08	x	8.40E-02	=	8.85E-10	1.23E-07	/[	1.00E-04	x	1000	]=	1.23E-06
Cobalt	9.61E-09	x	9.00E-03	=	8.65E-11	1.12E-07	/[	6.00E-06	x	1000	]=	1.87E-05
Copper	1.53E-08	x		=	NA	1.78E-07	/[		x	1000	]=	NA
Fluoride	2.48E-09	x		=	NA	2.89E-08	/[	1.30E-02	x	1000	]=	2.23E-09
Iron	2.81E-05	x		=	NA	3.28E-04	/[		x	1000	]=	NA
Lithium	8.72E-09	x		=	NA	1.02E-07	/[		x	1000	]=	NA
Manganese	4.54E-07	x		=	NA	5.29E-06	/[	5.00E-05	x	1000	]=	1.06E-04
Mercury	3.57E-11	x	0.00E+00	=	0.00E+00	4.16E-10	/[	3.00E-04	x	1000	]=	1.39E-09
Nickel	1.32E-08	x	2.60E-04	=	3.44E-12	1.54E-07	/[	9.00E-05	x	1000	]=	1.71E-06
Nitrate	8.40E-09	x		=	NA	9.80E-08	/[		x	1000	]=	NA
Nitrite	3.59E-09	x		=	NA	4.19E-08	/[		x	1000	]=	NA
Silver	9.60E-11	x		=	NA	1.12E-09	/[		x	1000	]=	NA
Strontium	4.25E-08	x		=	NA	4.96E-07	/[		x	1000	]=	NA
Tin	7.47E-09	x		=	NA	8.71E-08	/[		x	1000	]=	NA
Total Uranium	8.40E-10	x		=	NA	9.80E-09	/[	4.00E-05	x	1000	]=	2.45E-07
Vanadium	8.19E-08	x		=	NA	9.55E-07	/[	1.00E-04	x	1000	]=	9.55E-06
Zinc	4.50E-08	x		=	NA	5.25E-07	/[		x	1000	]=	NA
2-Butanone	2.92E-12	x	0.00E+00	=	0.00E+00	3.40E-11	/[	5.00E+00	x	1000	]=	6.81E-15
Bis(2-ethylhexyl) phthalate	4.73E-09	x	2.40E-06	=	1.14E-14	5.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.95E-11	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	4.22E-11	x	0.00E+00	=	0.00E+00	4.92E-10	/[	7.00E-01	x	1000	]=	7.03E-13
Methylene chloride	2.35E-12	x	1.00E-08	=	2.35E-20	2.74E-11	/[	6.00E-01	x	1000	]=	4.57E-14
o-Xylene	1.50E-13	x	0.00E+00	=	0.00E+00	1.75E-12	/[	1.00E-01	x	1000	]=	1.75E-14
Styrene	7.68E-13	x	0.00E+00	=	0.00E+00	8.96E-12	/[	1.00E+00	x	1000	]=	8.96E-15
Toluene	1.15E-12	x	0.00E+00	=	0.00E+00	1.34E-11	/[	5.00E+00	x	1000	]=	2.68E-15
Xylenes (total)	5.44E-13	x	0.00E+00	=	0.00E+00	6.34E-12	/[	1.00E-01	x	1000	]=	6.34E-14
beta-BHC	2.96E-11	x	5.30E-04	=	1.57E-14	3.46E-10	/[	0.00E+00	x	1000	]=	NA
Gamma-BHC (Lindane)	5.99E-12	x	3.10E-04	=	1.86E-15	6.99E-11	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	2.42E-11	x	5.70E-04	=	1.38E-14	2.82E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		9.94E-10					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.14E-07	x	1.50E+00	=	4.71E-07	3.66E-06	/	3.00E-04	=	1.22E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.50E-10	x		=	NA	4.08E-09	/	2.50E-05	=	1.63E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
2-Butanone	0.00E+00	x		=	NA	0.00E+00	/	6.00E-01	=	0.00E+00
Bis(2-ethylhexyl) phthalate	1.21E-06	x	1.40E-02	=	1.69E-08	1.41E-05	/	2.00E-02	=	7.06E-04
Butylbenzylphthalate	1.78E-08	x	1.90E-03	=	3.38E-11	2.07E-07	/	2.00E-01	=	1.04E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
o-Xylene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
Xylenes (total)	0.00E+00	x		=	NA	NA	/	2.00E-01	=	NA
beta-BHC	7.57E-09	x	1.80E+00	=	1.36E-08	8.83E-08	/		=	NA
Gamma-BHC (Lindane)	6.12E-10	x	1.10E+00	=	6.73E-10	7.14E-09	/	3.00E-04	=	2.38E-05
Aroclor-1260	8.65E-09	x	2.00E+00	=	1.73E-08	1.01E-07	/		=	NA
			Pathway total =		5.19E-07			Pathway total =		1.31E-02

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.7E-01**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-02	1%
Arsenic	Sum of all pathways	=	1.17E-05	Sum of all pathways	=	**3.0E-01**	11%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02	0%
Beryllium	Sum of all pathways	=	8.40E-13	Sum of all pathways	=	3.7E-03	0%
Cadmium	Sum of all pathways	=	2.46E-13	Sum of all pathways	=	3.1E-03	0%
Chromium	Sum of all pathways	=	8.85E-10	Sum of all pathways	=	**7.5E-02**	3%
Cobalt	Sum of all pathways	=	8.65E-11	Sum of all pathways	=	**6.8E-01**	26%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	8.1E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**8.6E-01**	32%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**9.3E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**6.9E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	1.4E-09	0%
Nickel	Sum of all pathways	=	3.44E-12	Sum of all pathways	=	1.4E-02	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-04	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.1E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-03	0%
Tin	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-04	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	6.0E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.5E-01**	13%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03	0%
2-Butanone	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	1.38E-07	Sum of all pathways	=	5.7E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.75E-10	Sum of all pathways	=	8.4E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	1.5E-05	0%
Methylene chloride	Sum of all pathways	=	8.57E-12	Sum of all pathways	=	8.3E-06	0%
o-Xylene	Sum of all pathways	=	NA	Sum of all pathways	=	1.6E-08	0%
Styrene	Sum of all pathways	=	NA	Sum of all pathways	=	8.2E-08	0%
Toluene	Sum of all pathways	=	NA	Sum of all pathways	=	3.1E-07	0%
Xylenes (total)	Sum of all pathways	=	NA	Sum of all pathways	=	5.8E-08	0%
beta-BHC	Sum of all pathways	=	1.11E-07	Sum of all pathways	=	**NA**	
Gamma-BHC (Lindane)	Sum of all pathways	=	1.27E-08	Sum of all pathways	=	4.5E-04	0%
Aroclor-1260	Sum of all pathways	=	1.06E-07	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.20E-05**
Total Noncarcinogenic Risk All Pathways and Chemicals	=	**2.67E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.
NA = not applicable

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	1.50E-02	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.48E-07	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.08E-05	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.94E-04	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	4.26E-07	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.95E-07	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	3.60E-05	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	2.18E-05	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.61E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	3.55E-06	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.59E-02	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.62E-05	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	8.74E-04	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	4.29E-06	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.80E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	6.95E-05	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	2.78E-06	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	2.11E-06	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.40E-07	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	7.16E-05	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.17E-06	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.42E-04	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	9.60E-05	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	4.29E-07	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Di-n-butylphthalate	1.22E-06	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	8.44E-10	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	1.32E-09	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.75E-01	=	[	7.01E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	6.40E-06	=	[	2.56E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.25E-04	=	[	5.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.26E-03	=	[	9.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	4.97E-06	=	[	1.99E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.44E-06	=	[	1.37E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	4.20E-04	=	[	1.68E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.55E-04	=	[	1.02E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.05E-04	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	4.14E-05	=	[	1.66E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.52E-01	=	[	2.61E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	1.89E-04	=	[	7.56E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	1.02E-02	=	[	4.08E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	5.00E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	3.27E-04	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	8.11E-04	=	[	3.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	3.25E-05	=	[	1.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	2.46E-05	=	[	9.83E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	1.64E-06	=	[	6.55E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	8.35E-04	=	[	3.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.36E-05	=	[	5.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.65E-03	=	[	6.61E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.12E-03	=	[	4.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	5.00E-06	=	[	2.00E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Di-n-butylphthalate	1.43E-05	=	[	5.70E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	9.85E-09	=	[	3.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	1.55E-08	=	[	6.18E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area H Plus I
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	

CARCINOGENIC EFFECTS

Aluminum	8.23E-06	=	[	9.6E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.00E-10	=	[	3.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.89E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.06E-07	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.33E-10	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.61E-10	=	[	1.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.97E-08	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.20E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.43E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.95E-09	=	[	2.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.06E-05	=	[	3.6E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.88E-09	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.79E-07	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.35E-09	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.54E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	3.81E-08	=	[	4.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	1.53E-09	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.15E-09	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.69E-11	=	[	9.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.92E-08	=	[	4.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	6.40E-10	=	[	7.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.77E-08	=	[	9.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.26E-08	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	2.35E-10	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	6.69E-10	=	[	7.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.63E-13	=	[	5.4E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	7.26E-13	=	[	8.5E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.60E-05	=	[	9.6E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.50E-09	=	[	3.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.88E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.24E-06	=	[	1.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.72E-09	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.88E-09	=	[	1.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	2.30E-07	=	[	2.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.39E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.27E-08	=	[	2.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.57E-04	=	[	3.6E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.04E-07	=	[	1.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.59E-06	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.79E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	4.44E-07	=	[	4.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	1.78E-08	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.35E-08	=	[	1.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.97E-10	=	[	9.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.57E-07	=	[	4.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	7.47E-09	=	[	7.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	9.06E-07	=	[	9.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.13E-07	=	[	6.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	2.74E-09	=	[	2.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	7.81E-09	=	[	7.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	5.40E-12	=	[	5.4E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	8.47E-12	=	[	8.5E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

CARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	4.52E-07	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	4.12E-10	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	6.00E-08	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Di-n-butylphthalate	1.71E-07	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.01E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.56E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	5.27E-06	=	[	5.02E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	9.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	1.99E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	4.81E-09	=	[	1.37E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.68E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	1.02E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	1.66E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.61E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	7.56E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	4.08E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	3.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	1.30E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	0.00E+00	=	[	9.83E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	6.55E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	5.45E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	6.61E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	4.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	7.00E-07	=	[	2.00E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Di-n-butylphthalate	2.00E-06	=	[	5.70E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	0.00E+00	=	[	3.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	6.18E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area H Plus I

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.50E-02	x	0.00E+00	=	0.00E+00	1.75E-01	/	1.00E+00	=	1.75E-01
Antimony	5.48E-07	x	0.00E+00	=	0.00E+00	6.40E-06	/	4.00E-04	=	1.60E-02
Arsenic	1.08E-05	x	1.50E+00	=	1.61E-05	1.25E-04	/	3.00E-04	=	4.18E-01
Barium	1.94E-04	x	0.00E+00	=	0.00E+00	2.26E-03	/	2.00E-01	=	1.13E-02
Beryllium	4.26E-07	x	0.00E+00	=	0.00E+00	4.97E-06	/	2.00E-03	=	2.48E-03
Cadmium	2.95E-07	x	0.00E+00	=	0.00E+00	3.44E-06	/	1.00E-03	=	3.44E-03
Chromium	3.60E-05	x	0.00E+00	=	0.00E+00	4.20E-04	/	3.00E-03	=	1.40E-01
Cobalt	2.18E-05	x	0.00E+00	=	0.00E+00	2.55E-04	/	3.00E-04	=	8.48E-01
Copper	2.61E-05	x	0.00E+00	=	0.00E+00	3.05E-04	/	4.00E-02	=	7.62E-03
Fluoride	3.55E-06	x	0.00E+00	=	0.00E+00	4.14E-05	/	4.00E-02	=	1.04E-03
Iron	5.59E-02	x	0.00E+00	=	0.00E+00	6.52E-01	/	7.00E-01	=	9.32E-01
Lithium	1.62E-05	x	0.00E+00	=	0.00E+00	1.89E-04	/	2.00E-03	=	9.45E-02
Manganese	8.74E-04	x	0.00E+00	=	0.00E+00	1.02E-02	/	1.40E-01	=	7.29E-02
Molybdenum	4.29E-06	x	0.00E+00	=	0.00E+00	5.00E-05	/	5.00E-03	=	1.00E-02
Nickel	2.80E-05	x	0.00E+00	=	0.00E+00	3.27E-04	/	2.00E-02	=	1.64E-02
Nitrate	6.95E-05	x	0.00E+00	=	0.00E+00	8.11E-04	/	7.10E+00	=	1.14E-04
Nitrite	2.78E-06	x	0.00E+00	=	0.00E+00	3.25E-05	/	3.00E-01	=	1.08E-04
Selenium	2.11E-06	x	0.00E+00	=	0.00E+00	2.46E-05	/	5.00E-03	=	4.91E-03
Silver	1.40E-07	x	0.00E+00	=	0.00E+00	1.64E-06	/	5.00E-03	=	3.27E-04
Strontium	7.16E-05	x	0.00E+00	=	0.00E+00	8.35E-04	/	6.00E-01	=	1.39E-03
Total Uranium	1.17E-06	x	0.00E+00	=	0.00E+00	1.36E-05	/	3.00E-03	=	4.54E-03
Vanadium	1.42E-04	x	0.00E+00	=	0.00E+00	1.65E-03	/	5.00E-03	=	3.31E-01
Zinc	9.60E-05	x	0.00E+00	=	0.00E+00	1.12E-03	/	3.00E-01	=	3.73E-03
Butylbenzylphthalate	4.29E-07	x	1.90E-03	=	8.14E-10	5.00E-06	/	2.00E-01	=	2.50E-05
Di-n-butylphthalate	1.22E-06	x	0.00E+00	=	0.00E+00	1.43E-05	/	1.00E-01	=	1.43E-04
Styrene	8.44E-10	x	0.00E+00	=	0.00E+00	9.85E-09	/	2.00E-01	=	4.92E-08
Toluene	1.32E-09	x	0.00E+00	=	0.00E+00	1.55E-08	/	8.00E-02	=	1.93E-07
			Pathway total	=	1.61E-05			Pathway total	=	3.10E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	8.23E-06	x		=	NA	9.60E-05	/[	5.00E-03	x	1000	]=	1.92E-05
Antimony	3.00E-10	x		=	NA	3.50E-09	/[		x	1000	]=	NA
Arsenic	5.89E-09	x	4.30E-03	=	2.53E-11	6.88E-08	/[	1.50E-05	x	1000	]=	4.58E-06
Barium	1.06E-07	x		=	NA	1.24E-06	/[	5.00E-04	x	1000	]=	2.48E-06
Beryllium	2.33E-10	x	2.40E-03	=	5.60E-13	2.72E-09	/[	2.00E-05	x	1001	]=	1.36E-07
Cadmium	1.61E-10	x	1.80E-03	=	2.90E-13	1.88E-09	/[	1.00E-05	x	1002	]=	1.88E-07
Chromium	1.97E-08	x	8.40E-02	=	1.66E-09	2.30E-07	/[	1.00E-04	x	1003	]=	2.29E-06
Cobalt	1.20E-08	x	9.00E-03	=	1.08E-10	1.39E-07	/[	6.00E-06	x	1004	]=	2.32E-05
Copper	1.43E-08	x		=	NA	1.67E-07	/[		x	1005	]=	NA
Fluoride	1.95E-09	x		=	NA	2.27E-08	/[	1.30E-02	x	1000	]=	1.75E-09
Iron	3.06E-05	x		=	NA	3.57E-04	/[		x	1000	]=	NA
Lithium	8.88E-09	x		=	NA	1.04E-07	/[		x	1000	]=	NA
Manganese	4.79E-07	x		=	NA	5.59E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Molybdenum	2.35E-09	x	0.00E+00	=	0.00E+00	2.74E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.54E-08	x	2.60E-04	=	3.99E-12	1.79E-07	/[	9.00E-05	x	1000	]=	1.99E-06
Nitrate	3.81E-08	x		=	NA	4.44E-07	/[		x	1000	]=	NA
Nitrite	1.53E-09	x		=	NA	1.78E-08	/[		x	1000	]=	NA
Selenium	1.15E-09	x	0.00E+00	=	0.00E+00	1.35E-08	/[	2.00E-02	x	1000	]=	6.73E-10
Silver	7.69E-11	x		=	NA	8.97E-10	/[		x	1000	]=	NA
Strontium	3.92E-08	x		=	NA	4.57E-07	/[		x	1000	]=	NA
Total Uranium	6.40E-10	x		=	NA	7.47E-09	/[	4.00E-05	x	1000	]=	1.87E-07
Vanadium	7.77E-08	x		=	NA	9.06E-07	/[	1.00E-04	x	1000	]=	9.06E-06
Zinc	5.26E-08	x		=	NA	6.13E-07	/[		x	1000	]=	NA
Butylbenzylphthalate	2.35E-10	x	0.00E+00	=	0.00E+00	2.74E-09	/[		x	1000	]=	NA
Di-n-butylphthalate	6.69E-10	x	0.00E+00	=	0.00E+00	7.81E-09	/[	0.00E+00	x	1000	]=	NA
Styrene	4.63E-13	x	0.00E+00	=	0.00E+00	5.40E-12	/[	1.00E+00	x	1000	]=	5.40E-15
Toluene	7.26E-13	x	0.00E+00	=	0.00E+00	8.47E-12	/	5.00E+00	x	1000	]=	1.69E-15
			Pathway total =		1.79E-09					Pathway total =		1.75E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.52E-07	x	1.50E+00	=	6.78E-07	5.27E-06	/	3.00E-04	=	1.76E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	4.12E-10	x		=	NA	4.81E-09	/	2.50E-05	=	1.92E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Butylbenzylphthalate	6.00E-08	x	1.90E-03	=	1.14E-10	7.00E-07	/	2.00E-01	=	3.50E-06
Di-n-butylphthalate	1.71E-07	x		=	NA	2.00E-06	/	1.00E-01	=	2.00E-05
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		6.78E-07			Pathway total =		1.78E-02

RPP-RPT-58329, Rev. 3

Chemical Totals			Carcinogenic Effects	% Cont			Noncarcinogenic Effects	% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.8E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-02	1%
Arsenic	Sum of all pathways	=	1.68E-05	100%	Sum of all pathways	=	**4.4E-01**	14%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-02	0%
Beryllium	Sum of all pathways	=	5.60E-13	0%	Sum of all pathways	=	2.5E-03	0%
Cadmium	Sum of all pathways	=	2.90E-13	0%	Sum of all pathways	=	3.6E-03	0%
Chromium	Sum of all pathways	=	1.66E-09	0%	Sum of all pathways	=	**1.4E-01**	4%
Cobalt	Sum of all pathways	=	1.08E-10	0%	Sum of all pathways	=	**8.5E-01**	27%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	7.6E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.3E-01**	30%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**9.5E-02**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**7.3E-02**	2%
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	0%
Nickel	Sum of all pathways	=	3.99E-12	0%	Sum of all pathways	=	1.6E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.1E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	4.9E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	4.5E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.3E-01**	11%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.7E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	9.28E-10	0%	Sum of all pathways	=	2.9E-05	0%
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-04	0%
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	4.9E-08	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-07	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.68E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.11E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
HQ = Hazard Quotient
ND = no data
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.66E-02	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	4.63E-06	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.69E-05	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	5.23E-04	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	7.03E-07	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Boron	9.41E-05	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.42E-07	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.49E-05	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.77E-05	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.96E-05	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	3.28E-06	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.16E-02	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.86E-05	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	8.21E-04	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	3.47E-08	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.94E-05	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.98E-05	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	5.36E-06	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.34E-07	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	2.68E-04	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Tin	7.71E-06	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.39E-06	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.16E-04	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	1.12E-04	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.44E-06	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.67E-07	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.94E-01	=	[	7.74E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	5.40E-05	=	[	2.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.97E-04	=	[	7.89E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	6.10E-03	=	[	2.44E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	8.20E-06	=	[	3.28E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Boron	1.10E-03	=	[	4.39E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	2.83E-06	=	[	1.13E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.90E-04	=	[	1.16E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.07E-04	=	[	8.27E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.45E-04	=	[	1.38E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	3.83E-05	=	[	1.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.03E-01	=	[	2.41E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.17E-04	=	[	8.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	9.58E-03	=	[	3.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	4.05E-07	=	[	1.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	3.43E-04	=	[	1.37E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	2.31E-04	=	[	9.23E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	6.25E-05	=	[	2.50E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	1.56E-06	=	[	6.24E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	3.13E-03	=	[	1.25E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Tin	9.00E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.63E-05	=	[	6.50E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.36E-03	=	[	5.43E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.31E-03	=	[	5.23E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	5.18E-05	=	[	2.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	1.95E-06	=	[	7.78E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area J
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.09E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.54E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	9.26E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	2.86E-07	=	[	3.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.85E-10	=	[	4.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	5.15E-08	=	[	6.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.33E-10	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.36E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.71E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.62E-08	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.80E-09	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.83E-05	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.02E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.50E-07	=	[	5.2E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.90E-11	=	[	2.2E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.61E-08	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.94E-09	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	7.33E-11	=	[	8.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	1.47E-07	=	[	1.7E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	4.23E-09	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.64E-10	=	[	8.9E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.38E-08	=	[	7.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	6.14E-08	=	[	7.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.43E-09	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	9.14E-11	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.06E-04	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	2.96E-08	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	1.08E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	3.34E-06	=	[	3.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	4.49E-09	=	[	4.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	6.01E-07	=	[	6.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.55E-09	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.59E-07	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.13E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.89E-07	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.10E-08	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.30E-04	=	[	3.3E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.19E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.25E-06	=	[	5.2E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.22E-10	=	[	2.2E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.88E-07	=	[	1.9E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.26E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	3.42E-08	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	8.55E-10	=	[	8.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	1.71E-06	=	[	1.7E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	4.93E-08	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.91E-09	=	[	8.9E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.44E-07	=	[	7.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	7.16E-07	=	[	7.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.84E-08	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.07E-09	=	[	1.1E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	7.10E-07	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	3.39E-10	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.21E-07	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	2.33E-08	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.74E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	8.28E-06	=	[	7.89E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	2.44E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	3.28E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Boron	0.00E+00	=	[	4.39E+01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.96E-09	=	[	1.13E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.16E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	8.27E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.38E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	1.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.41E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	8.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	1.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.37E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	9.23E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	2.50E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	6.24E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	1.25E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Tin	NA	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	6.50E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	5.43E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	5.23E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	7.25E-06	=	[	2.07E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	2.72E-07	=	[	7.78E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization

Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area J

Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.66E-02	x	0.00E+00	=	0.00E+00	1.94E-01	/	1.00E+00	=	1.94E-01
Antimony	4.63E-06	x	0.00E+00	=	0.00E+00	5.40E-05	/	4.00E-04	=	1.35E-01
Arsenic	1.69E-05	x	1.50E+00	=	2.54E-05	1.97E-04	/	3.00E-04	=	6.58E-01
Barium	5.23E-04	x	0.00E+00	=	0.00E+00	6.10E-03	/	2.00E-01	=	3.05E-02
Beryllium	7.03E-07	x	0.00E+00	=	0.00E+00	8.20E-06	/	2.00E-03	=	4.10E-03
Boron	9.41E-05	x	0.00E+00	=	0.00E+00	1.10E-03	/	2.00E-01	=	5.49E-03
Cadmium	2.42E-07	x	0.00E+00	=	0.00E+00	2.83E-06	/	1.00E-03	=	2.83E-03
Chromium	2.49E-05	x	0.00E+00	=	0.00E+00	2.90E-04	/	3.00E-03	=	9.67E-02
Cobalt	1.77E-05	x	0.00E+00	=	0.00E+00	2.07E-04	/	3.00E-04	=	6.89E-01
Copper	2.96E-05	x	0.00E+00	=	0.00E+00	3.45E-04	/	4.00E-02	=	8.63E-03
Fluoride	3.28E-06	x	0.00E+00	=	0.00E+00	3.83E-05	/	4.00E-02	=	9.56E-04
Iron	5.16E-02	x	0.00E+00	=	0.00E+00	6.03E-01	/	7.00E-01	=	8.61E-01
Lithium	1.86E-05	x	0.00E+00	=	0.00E+00	2.17E-04	/	2.00E-03	=	1.09E-01
Manganese	8.21E-04	x	0.00E+00	=	0.00E+00	9.58E-03	/	1.40E-01	=	6.84E-02
Mercury	3.47E-08	x	0.00E+00	=	0.00E+00	4.05E-07	/	0.00E+00	=	NA
Nickel	2.94E-05	x	0.00E+00	=	0.00E+00	3.43E-04	/	2.00E-02	=	1.71E-02
Nitrate	1.98E-05	x	0.00E+00	=	0.00E+00	2.31E-04	/	7.10E+00	=	3.25E-05
Nitrite	5.36E-06	x	0.00E+00	=	0.00E+00	6.25E-05	/	3.00E-01	=	2.08E-04
Silver	1.34E-07	x	0.00E+00	=	0.00E+00	1.56E-06	/	5.00E-03	=	3.12E-04
Strontium	2.68E-04	x	0.00E+00	=	0.00E+00	3.13E-03	/	6.00E-01	=	5.21E-03
Tin	7.71E-06	x	0.00E+00	=	0.00E+00	9.00E-05	/	6.00E-01	=	1.50E-04
Total Uranium	1.39E-06	x	0.00E+00	=	0.00E+00	1.63E-05	/	3.00E-03	=	5.42E-03
Vanadium	1.16E-04	x	0.00E+00	=	0.00E+00	1.36E-03	/	5.00E-03	=	2.72E-01
Zinc	1.12E-04	x	0.00E+00	=	0.00E+00	1.31E-03	/	3.00E-01	=	4.36E-03
Bis(2-ethylhexyl) phthalate	4.44E-06	x	1.40E-02	=	6.21E-08	5.18E-05	/	2.00E-02	=	2.59E-03
Butylbenzylphthalate	1.67E-07	x	1.90E-03	=	3.17E-10	1.95E-06	/	2.00E-01	=	9.73E-06
			Pathway total	=	2.54E-05			Pathway total	=	3.17E+00

RPP-RPT-58329, Rev. 3

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.09E-06	x		=	NA	1.06E-04	/[	5.00E-03	x	1000	]=	2.12E-05
Antimony	2.54E-09	x		=	NA	2.96E-08	/[		x	1000	]=	NA
Arsenic	9.26E-09	x	4.30E-03	=	3.98E-11	1.08E-07	/[	1.50E-05	x	1000	]=	7.21E-06
Barium	2.86E-07	x		=	NA	3.34E-06	/[	5.00E-04	x	1000	]=	6.68E-06
Beryllium	3.85E-10	x	2.40E-03	=	9.24E-13	4.49E-09	/[	2.00E-05	x	1000	]=	2.25E-07
Boron	5.15E-08	x	0.00E+00	=	0.00E+00	6.01E-07	/[	2.00E-02	x	1000	]=	3.01E-08
Cadmium	1.33E-10	x	1.80E-03	=	2.39E-13	1.55E-09	/[	1.00E-05	x	1000	]=	1.55E-07
Chromium	1.36E-08	x	8.40E-02	=	1.14E-09	1.59E-07	/[	1.00E-04	x	1000	]=	1.59E-06
Cobalt	9.71E-09	x	9.00E-03	=	8.74E-11	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.62E-08	x		=	NA	1.89E-07	/[		x	1000	]=	NA
Fluoride	1.80E-09	x		=	NA	2.10E-08	/[	1.30E-02	x	1000	]=	1.61E-09
Iron	2.83E-05	x		=	NA	3.30E-04	/[		x	1000	]=	NA
Lithium	1.02E-08	x		=	NA	1.19E-07	/[		x	1000	]=	NA
Manganese	4.50E-07	x		=	NA	5.25E-06	/[	5.00E-05	x	1000	]=	1.05E-04
Mercury	1.90E-11	x	0.00E+00	=	0.00E+00	2.22E-10	/[	3.00E-04	x	1000	]=	7.40E-10
Nickel	1.61E-08	x	2.60E-04	=	4.18E-12	1.88E-07	/[	9.00E-05	x	1000	]=	2.09E-06
Nitrate	1.08E-08	x		=	NA	1.26E-07	/[		x	1000	]=	NA
Nitrite	2.94E-09	x		=	NA	3.42E-08	/[		x	1000	]=	NA
Silver	7.33E-11	x		=	NA	8.55E-10	/[		x	1000	]=	NA
Strontium	1.47E-07	x		=	NA	1.71E-06	/[		x	1000	]=	NA
Tin	4.23E-09	x		=	NA	4.93E-08	/[		x	1000	]=	NA
Total Uranium	7.64E-10	x		=	NA	8.91E-09	/[	4.00E-05	x	1000	]=	2.23E-07
Vanadium	6.38E-08	x		=	NA	7.44E-07	/[	1.00E-04	x	1000	]=	7.44E-06
Zinc	6.14E-08	x		=	NA	7.16E-07	/[		x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.43E-09	x	2.40E-06	=	5.83E-15	2.84E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	9.14E-11	x	0.00E+00	=	0.00E+00	1.07E-09	/[		x	1000	]=	NA
			Pathway total =		1.28E-09					Pathway total =		1.71E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	7.10E-07	x	1.50E+00	=	1.07E-06	8.28E-06	/	3.00E-04	=	2.76E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Cadmium	3.39E-10	x		=	NA	3.96E-09	/	2.50E-05	=	1.58E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Bis(2-ethylhexyl) phthalate	6.21E-07	x	1.40E-02	=	8.69E-09	7.25E-06	/	2.00E-02	=	3.62E-04
Butylbenzylphthalate	2.33E-08	x	1.90E-03	=	4.43E-11	2.72E-07	/	2.00E-01	=	1.36E-06
			Pathway total =		1.07E-06			Pathway total =		2.81E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.9E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	**1.4E-01**	4%
Arsenic	Sum of all pathways	=	2.64E-05	100%	Sum of all pathways	=	**6.9E-01**	21%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-02	1%
Beryllium	Sum of all pathways	=	9.24E-13	0%	Sum of all pathways	=	4.1E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	5.5E-03	0%
Cadmium	Sum of all pathways	=	2.39E-13	0%	Sum of all pathways	=	3.0E-03	0%
Chromium	Sum of all pathways	=	1.14E-09	0%	Sum of all pathways	=	**9.7E-02**	3%
Cobalt	Sum of all pathways	=	8.74E-11	0%	Sum of all pathways	=	**6.9E-01**	22%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.6E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	9.6E-04	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**8.6E-01**	27%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.1E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**6.8E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	7.4E-10	0%
Nickel	Sum of all pathways	=	4.18E-12	0%	Sum of all pathways	=	1.7E-02	1%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.3E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.1E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	5.2E-03	0%
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-04	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.4E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**2.7E-01**	8%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-03	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.08E-08	0%	Sum of all pathways	=	2.9E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	3.61E-10	0%	Sum of all pathways	=	1.1E-05	0%

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**2.65E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.20E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.37E-02	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.77E-07	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	7.71E-06	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.79E-04	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	3.51E-07	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.05E-07	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.07E-05	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.77E-05	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.61E-05	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	2.71E-06	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	4.51E-02	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.51E-05	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	7.63E-04	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	3.66E-08	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	5.25E-06	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.81E-05	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.65E-05	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	6.64E-06	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	2.89E-06	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	2.01E-07	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	6.64E-05	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.47E-06	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.27E-04	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	8.14E-05	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	9.90E-08	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
1-Butanol	4.76E-08	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	3.94E-06	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.27E-07	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Hexane	1.30E-07	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	4.85E-08	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.60E-01	=	[	6.40E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	6.73E-06	=	[	2.69E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	9.00E-05	=	[	3.60E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.09E-03	=	[	8.34E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	4.10E-06	=	[	1.64E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	2.39E-06	=	[	9.56E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.42E-04	=	[	9.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.06E-04	=	[	8.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.04E-04	=	[	1.22E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	3.16E-05	=	[	1.26E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	5.27E-01	=	[	2.11E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	1.77E-04	=	[	7.07E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	8.90E-03	=	[	3.56E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	4.28E-07	=	[	1.71E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	6.13E-05	=	[	2.45E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	3.28E-04	=	[	1.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	1.92E-04	=	[	7.68E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	7.75E-05	=	[	3.10E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	3.38E-05	=	[	1.35E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	2.35E-06	=	[	9.40E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	7.75E-04	=	[	3.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.72E-05	=	[	6.88E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.48E-03	=	[	5.91E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	9.50E-04	=	[	3.80E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	1.16E-06	=	[	4.62E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
1-Butanol	5.55E-07	=	[	2.22E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	4.60E-05	=	[	1.84E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	1.48E-06	=	[	5.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Hexane	1.51E-06	=	[	6.05E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	5.66E-07	=	[	2.27E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft)- Exposure Area L1 plus L2
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	7.51E-06	=	[	8.8E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.16E-10	=	[	3.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	4.23E-09	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.80E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	1.92E-10	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.12E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.14E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	9.70E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.43E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	1.48E-09	=	[	1.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.47E-05	=	[	2.9E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	8.30E-09	=	[	9.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.18E-07	=	[	4.9E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.01E-11	=	[	2.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.88E-09	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.54E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	9.02E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	3.64E-09	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	1.59E-09	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	1.10E-10	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.64E-08	=	[	4.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	8.07E-10	=	[	9.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.94E-08	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	4.46E-08	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	5.42E-11	=	[	6.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
1-Butanol	2.61E-11	=	[	3.0E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.16E-09	=	[	2.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	6.95E-11	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Hexane	7.10E-11	=	[	8.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	2.66E-11	=	[	3.1E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	8.76E-05	=	[	8.8E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.69E-09	=	[	3.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	4.93E-08	=	[	4.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.14E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.24E-09	=	[	2.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.31E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.33E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.13E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.67E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	1.73E-08	=	[	1.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	2.89E-04	=	[	2.9E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	9.68E-08	=	[	9.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.88E-06	=	[	4.9E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.34E-10	=	[	2.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.36E-08	=	[	3.4E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.80E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.05E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	4.25E-08	=	[	4.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	1.85E-08	=	[	1.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	1.29E-09	=	[	1.3E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.25E-07	=	[	4.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.42E-09	=	[	9.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.10E-07	=	[	8.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	5.21E-07	=	[	5.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	6.33E-10	=	[	6.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
1-Butanol	3.04E-10	=	[	3.0E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	2.52E-08	=	[	2.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	8.11E-10	=	[	8.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Hexane	8.29E-10	=	[	8.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.10E-10	=	[	3.1E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	3.24E-07	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.87E-10	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
1-Butanol	6.66E-09	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	5.52E-07	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	1.78E-08	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	6.80E-09	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	6.40E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.69E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	3.78E-06	=	[	3.60E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	8.34E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	1.64E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.35E-09	=	[	9.56E-02	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	9.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	8.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.22E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	1.26E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.11E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	7.07E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.56E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	1.71E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	0.00E+00	=	[	2.45E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	7.68E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	3.10E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	0.00E+00	=	[	1.35E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	9.40E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	6.88E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	5.91E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	3.80E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	0.00E+00	=	[	4.62E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
1-Butanol	7.77E-08	=	[	2.22E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	6.44E-06	=	[	1.84E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	2.07E-07	=	[	5.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Hexane	0.00E+00	=	[	6.05E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	NA	=	[	2.27E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area L1 plus L2
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.37E-02	x	0.00E+00	=	0.00E+00	1.60E-01	/	1.00E+00	=	1.60E-01
Antimony	5.77E-07	x	0.00E+00	=	0.00E+00	6.73E-06	/	4.00E-04	=	1.68E-02
Arsenic	7.71E-06	x	1.50E+00	=	1.16E-05	9.00E-05	/	3.00E-04	=	3.00E-01
Barium	1.79E-04	x	0.00E+00	=	0.00E+00	2.09E-03	/	2.00E-01	=	1.04E-02
Beryllium	3.51E-07	x	0.00E+00	=	0.00E+00	4.10E-06	/	2.00E-03	=	2.05E-03
Cadmium	2.05E-07	x	0.00E+00	=	0.00E+00	2.39E-06	/	1.00E-03	=	2.39E-03
Chromium	2.07E-05	x	0.00E+00	=	0.00E+00	2.42E-04	/	3.00E-03	=	8.07E-02
Cobalt	1.77E-05	x	0.00E+00	=	0.00E+00	2.06E-04	/	3.00E-04	=	6.88E-01
Copper	2.61E-05	x	0.00E+00	=	0.00E+00	3.04E-04	/	4.00E-02	=	7.61E-03
Fluoride	2.71E-06	x	0.00E+00	=	0.00E+00	3.16E-05	/	4.00E-02	=	7.90E-04
Iron	4.51E-02	x	0.00E+00	=	0.00E+00	5.27E-01	/	7.00E-01	=	7.52E-01
Lithium	1.51E-05	x	0.00E+00	=	0.00E+00	1.77E-04	/	2.00E-03	=	8.84E-02
Manganese	7.63E-04	x	0.00E+00	=	0.00E+00	8.90E-03	/	1.40E-01	=	6.36E-02
Mercury	3.66E-08	x	0.00E+00	=	0.00E+00	4.28E-07	/	0.00E+00	=	NA
Molybdenum	5.25E-06	x	0.00E+00	=	0.00E+00	6.13E-05	/	5.00E-03	=	1.23E-02
Nickel	2.81E-05	x	0.00E+00	=	0.00E+00	3.28E-04	/	2.00E-02	=	1.64E-02
Nitrate	1.65E-05	x	0.00E+00	=	0.00E+00	1.92E-04	/	7.10E+00	=	2.71E-05
Nitrite	6.64E-06	x	0.00E+00	=	0.00E+00	7.75E-05	/	3.00E-01	=	2.58E-04
Selenium	2.89E-06	x	0.00E+00	=	0.00E+00	3.38E-05	/	5.00E-03	=	6.75E-03
Silver	2.01E-07	x	0.00E+00	=	0.00E+00	2.35E-06	/	5.00E-03	=	4.70E-04
Strontium	6.64E-05	x	0.00E+00	=	0.00E+00	7.75E-04	/	6.00E-01	=	1.29E-03
Total Uranium	1.47E-06	x	0.00E+00	=	0.00E+00	1.72E-05	/	3.00E-03	=	5.73E-03
Vanadium	1.27E-04	x	0.00E+00	=	0.00E+00	1.48E-03	/	5.00E-03	=	2.96E-01
Zinc	8.14E-05	x	0.00E+00	=	0.00E+00	9.50E-04	/	3.00E-01	=	3.17E-03
Acetone	9.90E-08	x	0.00E+00	=	0.00E+00	1.16E-06	/	9.00E-01	=	1.28E-06
1-Butanol	4.76E-08	x	0.00E+00	=	0.00E+00	5.55E-07	/	1.00E-01	=	5.55E-06
Bis(2-ethylhexyl) phthalate	3.94E-06	x	1.40E-02	=	5.52E-08	4.60E-05	/	2.00E-02	=	2.30E-03
Butylbenzylphthalate	1.27E-07	x	1.90E-03	=	2.41E-10	1.48E-06	/	2.00E-01	=	7.40E-06
Hexane	1.30E-07	x	0.00E+00	=	0.00E+00	1.51E-06	/	6.00E-02	=	2.52E-05
beta-BHC	4.85E-08	x	1.80E+00	=	8.74E-08	5.66E-07	/	0.00E+00	=	NA
			Pathway total	=	1.17E-05			Pathway total	=	2.52E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	7.51E-06	x		=	NA	8.76E-05	/[	5.00E-03	x	1000	]=	1.75E-05
Antimony	3.16E-10	x		=	NA	3.69E-09	/[		x	1000	]=	NA
Arsenic	4.23E-09	x	4.30E-03	=	1.82E-11	4.93E-08	/[	1.50E-05	x	1000	]=	3.29E-06
Barium	9.80E-08	x		=	NA	1.14E-06	/[	5.00E-04	x	1000	]=	2.29E-06
Beryllium	1.92E-10	x	2.40E-03	=	4.62E-13	2.24E-09	/[	2.00E-05	x	1000	]=	1.12E-07
Cadmium	1.12E-10	x	1.80E-03	=	2.02E-13	1.31E-09	/[	1.00E-05	x	1000	]=	1.31E-07
Chromium	1.14E-08	x	8.40E-02	=	9.55E-10	1.33E-07	/[	1.00E-04	x	1000	]=	1.33E-06
Cobalt	9.70E-09	x	9.00E-03	=	8.73E-11	1.13E-07	/[	6.00E-06	x	1000	]=	1.89E-05
Copper	1.43E-08	x		=	NA	1.67E-07	/[		x	1000	]=	NA
Fluoride	1.48E-09	x		=	NA	1.73E-08	/[	1.30E-02	x	1000	]=	1.33E-09
Iron	2.47E-05	x		=	NA	2.89E-04	/[		x	1000	]=	NA
Lithium	8.30E-09	x		=	NA	9.68E-08	/[		x	1000	]=	NA
Manganese	4.18E-07	x		=	NA	4.88E-06	/[	5.00E-05	x	1000	]=	9.75E-05
Mercury	2.01E-11	x	0.00E+00	=	0.00E+00	2.34E-10	/[	3.00E-04	x	1000	]=	7.81E-10
Molybdenum	2.88E-09	x	0.00E+00	=	0.00E+00	3.36E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.54E-08	x	2.60E-04	=	4.01E-12	1.80E-07	/[	9.00E-05	x	1000	]=	2.00E-06
Nitrate	9.02E-09	x		=	NA	1.05E-07	/[		x	1000	]=	NA
Nitrite	3.64E-09	x		=	NA	4.25E-08	/[		x	1000	]=	NA
Selenium	1.59E-09	x	0.00E+00	=	0.00E+00	1.85E-08	/[	2.00E-02	x	1000	]=	9.25E-10
Silver	1.10E-10	x		=	NA	1.29E-09	/[		x	1000	]=	NA
Strontium	3.64E-08	x		=	NA	4.25E-07	/[		x	1000	]=	NA
Total Uranium	8.07E-10	x		=	NA	9.42E-09	/[	4.00E-05	x	1000	]=	2.36E-07
Vanadium	6.94E-08	x		=	NA	8.10E-07	/[	1.00E-04	x	1000	]=	8.10E-06
Zinc	4.46E-08	x		=	NA	5.21E-07	/[		x	1000	]=	NA
Acetone	5.42E-11	x	0.00E+00	=	0.00E+00	6.33E-10	/[	3.10E+01	x	1000	]=	2.04E-14
1-Butanol	2.61E-11	x	0.00E+00	=	0.00E+00	3.04E-10	/[	0.00E+00	x	1000	]=	NA
Bis(2-ethylhexyl) phthalate	2.16E-09	x	2.40E-06	=	5.19E-15	2.52E-08	/[	0.00E+00	x	1000	]=	NA
Butylbenzylphthalate	6.95E-11	x	0.00E+00	=	0.00E+00	8.11E-10	/[		x	1000	]=	NA
Hexane	7.10E-11	x	0.00E+00	=	0.00E+00	8.29E-10	/[	7.00E-01	x	1000	]=	1.18E-12
beta-BHC	2.66E-11	x	5.30E-04	=	1.41E-14	3.10E-10	/[	0.00E+00	x	1000	]=	NA
			Pathway total =		1.06E-09					Pathway total =		1.51E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	3.24E-07	x	1.50E+00	=	4.86E-07	3.78E-06	/	3.00E-04	=	1.26E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	2.87E-10	x		=	NA	3.35E-09	/	2.50E-05	=	1.34E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
1-Butanol	6.66E-09	x		=	NA	7.77E-08	/	1.00E-01	=	7.77E-07
Bis(2-ethylhexyl) phthalate	5.52E-07	x	1.40E-02	=	7.73E-09	6.44E-06	/	2.00E-02	=	3.22E-04
Butylbenzylphthalate	1.78E-08	x	1.90E-03	=	3.37E-11	2.07E-07	/	2.00E-01	=	1.04E-06
Hexane	0.00E+00	x		=	NA	0.00E+00	/	6.00E-02	=	0.00E+00
beta-BHC	6.80E-09	x	1.80E+00	=	1.22E-08	NA	/		=	NA
			Pathway total =		5.06E-07			Pathway total =		1.31E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA	Sum of all pathways	=	**1.6E-01**	6%
Antimony	Sum of all pathways	=	NA	Sum of all pathways	=	1.7E-02	1%
Arsenic	Sum of all pathways	=	1.21E-05	Sum of all pathways	=	**3.1E-01**	12%
Barium	Sum of all pathways	=	NA	Sum of all pathways	=	1.0E-02	0%
Beryllium	Sum of all pathways	=	4.62E-13	Sum of all pathways	=	2.0E-03	0%
Cadmium	Sum of all pathways	=	2.02E-13	Sum of all pathways	=	2.5E-03	0%
Chromium	Sum of all pathways	=	9.55E-10	Sum of all pathways	=	**8.1E-02**	3%
Cobalt	Sum of all pathways	=	8.73E-11	Sum of all pathways	=	**6.9E-01**	27%
Copper	Sum of all pathways	=	NA	Sum of all pathways	=	7.6E-03	0%
Fluoride	Sum of all pathways	=	NA	Sum of all pathways	=	7.9E-04	0%
Iron	Sum of all pathways	=	NA	Sum of all pathways	=	**7.5E-01**	30%
Lithium	Sum of all pathways	=	NA	Sum of all pathways	=	**8.8E-02**	3%
Manganese	Sum of all pathways	=	NA	Sum of all pathways	=	**6.4E-02**	3%
Mercury	Sum of all pathways	=	NA	Sum of all pathways	=	7.8E-10	0%
Molybdenum	Sum of all pathways	=	NA	Sum of all pathways	=	1.2E-02	0%
Nickel	Sum of all pathways	=	4.01E-12	Sum of all pathways	=	1.6E-02	1%
Nitrate	Sum of all pathways	=	NA	Sum of all pathways	=	2.7E-05	0%
Nitrite	Sum of all pathways	=	NA	Sum of all pathways	=	2.6E-04	0%
Selenium	Sum of all pathways	=	NA	Sum of all pathways	=	6.8E-03	0%
Silver	Sum of all pathways	=	NA	Sum of all pathways	=	4.7E-04	0%
Strontium	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-03	0%
Total Uranium	Sum of all pathways	=	NA	Sum of all pathways	=	5.7E-03	0%
Vanadium	Sum of all pathways	=	NA	Sum of all pathways	=	**3.0E-01**	12%
Zinc	Sum of all pathways	=	NA	Sum of all pathways	=	3.2E-03	0%
Acetone	Sum of all pathways	=	NA	Sum of all pathways	=	1.3E-06	0%
1-Butanol	Sum of all pathways	=	NA	Sum of all pathways	=	6.3E-06	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	6.29E-08	Sum of all pathways	=	2.6E-03	0%
Butylbenzylphthalate	Sum of all pathways	=	2.75E-10	Sum of all pathways	=	8.4E-06	0%
Hexane	Sum of all pathways	=	NA	Sum of all pathways	=	2.5E-05	0%
beta-BHC	Sum of all pathways	=	9.96E-08	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.22E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**2.53E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.53E-02	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.04E-07	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.09E-05	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.75E-04	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	5.92E-07	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	2.59E-07	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.66E-05	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.96E-05	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.74E-05	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	6.16E-06	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.42E-02	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.79E-05	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	7.81E-04	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	4.11E-08	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.38E-05	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	2.45E-05	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	9.87E-06	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	3.80E-07	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	7.10E-05	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Tin	3.09E-05	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	3.36E-06	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.67E-04	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	3.93E-04	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	2.10E-08	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	4.93E-06	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Di-n-butylphthalate	1.85E-06	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	2.87E-09	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	6.30E-10	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	5.53E-08	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1260	5.74E-08	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

RPP-RPT-58329, Rev. 3

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	1.78E-01	=	[	7.13E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	5.88E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.27E-04	=	[	5.06E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.04E-03	=	[	8.15E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	6.90E-06	=	[	2.76E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	3.02E-06	=	[	1.21E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	3.10E-04	=	[	1.24E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.29E-04	=	[	9.16E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.19E-04	=	[	1.28E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	7.18E-05	=	[	2.87E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.33E-01	=	[	2.53E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.09E-04	=	[	8.37E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	9.11E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	4.80E-07	=	[	1.92E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	2.78E-04	=	[	1.11E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	2.86E-04	=	[	1.14E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	1.15E-04	=	[	4.61E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	4.44E-06	=	[	1.77E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	8.29E-04	=	[	3.31E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Tin	3.60E-04	=	[	1.44E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	3.92E-05	=	[	1.57E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.94E-03	=	[	7.78E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	4.59E-03	=	[	1.83E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	2.45E-07	=	[	9.80E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	5.75E-05	=	[	2.30E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Di-n-butylphthalate	2.16E-05	=	[	8.63E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	3.35E-08	=	[	1.34E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	7.35E-09	=	[	2.94E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	6.45E-07	=	[	2.58E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1260	6.70E-07	=	[	2.68E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	8.37E-06	=	[	9.8E-05	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.76E-10	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	5.95E-09	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.57E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	3.24E-10	=	[	3.8E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	1.42E-10	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.46E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.50E-08	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	3.37E-09	=	[	3.9E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.97E-05	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	9.82E-09	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.28E-07	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.25E-11	=	[	2.6E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.30E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	1.34E-08	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	5.41E-09	=	[	6.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	2.08E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	3.89E-08	=	[	4.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Tin	1.69E-08	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	1.84E-09	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	9.13E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	2.15E-07	=	[	2.5E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	1.15E-11	=	[	1.3E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Bis(2-ethylhexyl) phthalate	2.70E-09	=	[	3.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Di-n-butylphthalate	1.01E-09	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.57E-12	=	[	1.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	3.45E-13	=	[	4.0E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
beta-BHC	3.03E-11	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Aroclor-1260	3.15E-11	=	[	3.7E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

RPP-RPT-58329, Rev. 3

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	9.76E-05	=	[	9.8E-05	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	6.94E-08	=	[	6.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.12E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.78E-09	=	[	3.8E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	1.65E-09	=	[	1.7E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.70E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.25E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.75E-07	=	[	1.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	3.94E-08	=	[	3.9E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.47E-04	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.15E-07	=	[	1.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.63E-10	=	[	2.6E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.52E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.57E-07	=	[	1.6E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	6.31E-08	=	[	6.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	2.43E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	4.54E-07	=	[	4.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Tin	1.97E-07	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	2.15E-08	=	[	2.1E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	1.07E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	2.51E-06	=	[	2.5E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	1.34E-10	=	[	1.3E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Bis(2-ethylhexyl) phthalate	3.15E-08	=	[	3.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Di-n-butylphthalate	1.18E-08	=	[	1.2E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.84E-11	=	[	1.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	4.03E-12	=	[	4.0E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
beta-BHC	3.53E-10	=	[	3.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Aroclor-1260	3.67E-10	=	[	3.7E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	4.56E-07	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	3.62E-10	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Bis(2-ethylhexyl) phthalate	6.90E-07	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Di-n-butylphthalate	2.59E-07	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
beta-BHC	7.74E-09	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Aroclor-1260	1.13E-08	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	NA	=	[	7.13E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	5.32E-06	=	[	5.06E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	8.15E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	2.76E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	4.23E-09	=	[	1.21E-01	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.24E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	9.16E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.28E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	2.87E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.53E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	8.37E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	1.92E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.11E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	1.14E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	4.61E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	1.77E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.31E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Tin	NA	=	[	1.44E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	1.57E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	7.78E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	1.83E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	0.00E+00	=	[	9.80E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Bis(2-ethylhexyl) phthalate	8.05E-06	=	[	2.30E+00	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Di-n-butylphthalate	3.02E-06	=	[	8.63E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.34E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	2.94E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
beta-BHC	NA	=	[	2.58E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Aroclor-1260	1.31E-07	=	[	2.68E-02	x	1.00E-06	x	2,800	x	0.2	x	0.14	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area P
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.53E-02	x	0.00E+00	=	0.00E+00	1.78E-01	/	1.00E+00	=	1.78E-01
Antimony	5.04E-07	x	0.00E+00	=	0.00E+00	5.88E-06	/	4.00E-04	=	1.47E-02
Arsenic	1.09E-05	x	1.50E+00	=	1.63E-05	1.27E-04	/	3.00E-04	=	4.22E-01
Barium	1.75E-04	x	0.00E+00	=	0.00E+00	2.04E-03	/	2.00E-01	=	1.02E-02
Beryllium	5.92E-07	x	0.00E+00	=	0.00E+00	6.90E-06	/	2.00E-03	=	3.45E-03
Cadmium	2.59E-07	x	0.00E+00	=	0.00E+00	3.02E-06	/	1.00E-03	=	3.02E-03
Chromium	2.66E-05	x	0.00E+00	=	0.00E+00	3.10E-04	/	3.00E-03	=	1.03E-01
Cobalt	1.96E-05	x	0.00E+00	=	0.00E+00	2.29E-04	/	3.00E-04	=	7.63E-01
Copper	2.74E-05	x	0.00E+00	=	0.00E+00	3.19E-04	/	4.00E-02	=	7.98E-03
Fluoride	6.16E-06	x	0.00E+00	=	0.00E+00	7.18E-05	/	4.00E-02	=	1.80E-03
Iron	5.42E-02	x	0.00E+00	=	0.00E+00	6.33E-01	/	7.00E-01	=	9.04E-01
Lithium	1.79E-05	x	0.00E+00	=	0.00E+00	2.09E-04	/	2.00E-03	=	1.05E-01
Manganese	7.81E-04	x	0.00E+00	=	0.00E+00	9.11E-03	/	1.40E-01	=	6.51E-02
Mercury	4.11E-08	x	0.00E+00	=	0.00E+00	4.80E-07	/	0.00E+00	=	NA
Nickel	2.38E-05	x	0.00E+00	=	0.00E+00	2.78E-04	/	2.00E-02	=	1.39E-02
Nitrate	2.45E-05	x	0.00E+00	=	0.00E+00	2.86E-04	/	7.10E+00	=	4.03E-05
Nitrite	9.87E-06	x	0.00E+00	=	0.00E+00	1.15E-04	/	3.00E-01	=	3.84E-04
Silver	3.80E-07	x	0.00E+00	=	0.00E+00	4.44E-06	/	5.00E-03	=	8.87E-04
Strontium	7.10E-05	x	0.00E+00	=	0.00E+00	8.29E-04	/	6.00E-01	=	1.38E-03
Tin	3.09E-05	x	0.00E+00	=	0.00E+00	3.60E-04	/	6.00E-01	=	6.00E-04
Total Uranium	3.36E-06	x	0.00E+00	=	0.00E+00	3.92E-05	/	3.00E-03	=	1.31E-02
Vanadium	1.67E-04	x	0.00E+00	=	0.00E+00	1.94E-03	/	5.00E-03	=	3.89E-01
Zinc	3.93E-04	x	0.00E+00	=	0.00E+00	4.59E-03	/	3.00E-01	=	1.53E-02
Acetone	2.10E-08	x	0.00E+00	=	0.00E+00	2.45E-07	/	9.00E-01	=	2.72E-07
Bis(2-ethylhexyl) phthalate	4.93E-06	x	1.40E-02	=	6.90E-08	5.75E-05	/	2.00E-02	=	2.88E-03
Di-n-butylphthalate	1.85E-06	x	0.00E+00	=	0.00E+00	2.16E-05	/	1.00E-01	=	2.16E-04
Methylene chloride	2.87E-09	x	2.00E-03	=	5.74E-12	3.35E-08	/	6.00E-03	=	5.58E-06
Toluene	6.30E-10	x	0.00E+00	=	0.00E+00	7.35E-09	/	8.00E-02	=	9.19E-08
beta-BHC	5.53E-08	x	1.80E+00	=	9.95E-08	6.45E-07	/	0.00E+00	=	NA
Aroclor-1260	5.74E-08	x	2.00E+00	=	1.15E-07	6.70E-07	/	0.00E+00	=	NA
			Pathway total	=	1.66E-05			Pathway total	=	3.02E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
Equation	**EC**	**x**	**IUR**	**=**	**CR**	**EC**	**/[**	**Rfc**	**x**	**CF**	**]=**	**HQ**
Units	**ug/m^3**		**(ug/m^3)$^{-1}$**		**unitless**	**ug/m^3**		**ug/m^3**		ug/mg		**unitless**
Aluminum	8.37E-06	x		=	NA	9.76E-05	/[	5.00E-03	x	1000	]=	1.95E-05
Antimony	2.76E-10	x		=	NA	3.22E-09	/[		x	1000	]=	NA
Arsenic	5.95E-09	x	4.30E-03	=	2.56E-11	6.94E-08	/[	1.50E-05	x	1000	]=	4.62E-06
Barium	9.57E-08	x		=	NA	1.12E-06	/[	5.00E-04	x	1000	]=	2.23E-06
Beryllium	3.24E-10	x	2.40E-03	=	7.78E-13	3.78E-09	/[	2.00E-05	x	1000	]=	1.89E-07
Cadmium	1.42E-10	x	1.80E-03	=	2.55E-13	1.65E-09	/[	1.00E-05	x	1000	]=	1.65E-07
Chromium	1.46E-08	x	8.40E-02	=	1.22E-09	1.70E-07	/[	1.00E-04	x	1000	]=	1.70E-06
Cobalt	1.08E-08	x	9.00E-03	=	9.68E-11	1.25E-07	/[	6.00E-06	x	1000	]=	2.09E-05
Copper	1.50E-08	x		=	NA	1.75E-07	/[		x	1000	]=	NA
Fluoride	3.37E-09	x		=	NA	3.94E-08	/[	1.30E-02	x	1000	]=	3.03E-09
Iron	2.97E-05	x		=	NA	3.47E-04	/[		x	1000	]=	NA
Lithium	9.82E-09	x		=	NA	1.15E-07	/[		x	1000	]=	NA
Manganese	4.28E-07	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.98E-05
Mercury	2.25E-11	x	0.00E+00	=	0.00E+00	2.63E-10	/[	3.00E-04	x	1000	]=	8.77E-10
Nickel	1.30E-08	x	2.60E-04	=	3.39E-12	1.52E-07	/[	9.00E-05	x	1000	]=	1.69E-06
Nitrate	1.34E-08	x		=	NA	1.57E-07	/[		x	1000	]=	NA
Nitrite	5.41E-09	x		=	NA	6.31E-08	/[		x	1000	]=	NA
Silver	2.08E-10	x		=	NA	2.43E-09	/[		x	1000	]=	NA
Strontium	3.89E-08	x		=	NA	4.54E-07	/[		x	1000	]=	NA
Tin	1.69E-08	x		=	NA	1.97E-07	/[		x	1000	]=	NA
Total Uranium	1.84E-09	x		=	NA	2.15E-08	/[	4.00E-05	x	1000	]=	5.37E-07
Vanadium	9.13E-08	x		=	NA	1.07E-06	/[	1.00E-04	x	1000	]=	1.07E-05
Zinc	2.15E-07	x		=	NA	2.51E-06	/[		x	1000	]=	NA
Acetone	1.15E-11	x	0.00E+00	=	0.00E+00	1.34E-10	/[	3.10E+01	x	1000	]=	4.33E-15
Bis(2-ethylhexyl) phthalate	2.70E-09	x	2.40E-06	=	6.48E-15	3.15E-08	/[	0.00E+00	x	1000	]=	NA
Di-n-butylphthalate	1.01E-09	x	0.00E+00	=	0.00E+00	1.18E-08	/[	0.00E+00	x	1000	]=	NA
Methylene chloride	1.57E-12	x	1.00E-08	=	1.57E-20	1.84E-11	/[	6.00E-01	x	1000	]=	3.06E-14
Toluene	3.45E-13	x	0.00E+00	=	0.00E+00	4.03E-12	/[	5.00E+00	x	1000	]=	8.05E-16
beta-BHC	3.03E-11	x	5.30E-04	=	1.61E-14	3.53E-10	/[	0.00E+00	x	1000	]=	NA
Aroclor-1260	3.15E-11	x	5.70E-04	=	1.79E-14	3.67E-10	/	0.00E+00	x	1000	]=	NA
			Pathway total =		1.35E-09					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	4.56E-07	x	1.50E+00	=	6.84E-07	5.32E-06	/	3.00E-04	=	1.77E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	3.62E-10	x		=	NA	4.23E-09	/	2.50E-05	=	1.69E-04
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Tin	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Bis(2-ethylhexyl) phthalate	6.90E-07	x	1.40E-02	=	9.66E-09	8.05E-06	/	2.00E-02	=	4.03E-04
Di-n-butylphthalate	2.59E-07	x		=	NA	3.02E-06	/	1.00E-01	=	3.02E-05
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
beta-BHC	7.74E-09	x	1.80E+00	=	1.39E-08	NA	/		=	NA
Aroclor-1260	1.13E-08	x	2.00E+00	=	2.25E-08	1.31E-07	/		=	NA
			Pathway total =		7.30E-07			Pathway total =		1.83E-02

RPP-RPT-58329, Rev. 3

Chemical Totals	Carcinogenic Effects			% Co	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**1.8E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02	0%
Arsenic	Sum of all pathways	=	1.70E-05	98%	Sum of all pathways	=	**4.4E-01**	14%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	0%
Beryllium	Sum of all pathways	=	7.78E-13	0%	Sum of all pathways	=	3.5E-03	0%
Cadmium	Sum of all pathways	=	2.55E-13	0%	Sum of all pathways	=	3.2E-03	0%
Chromium	Sum of all pathways	=	1.22E-09	0%	Sum of all pathways	=	**1.0E-01**	3%
Cobalt	Sum of all pathways	=	9.68E-11	0%	Sum of all pathways	=	**7.6E-01**	25%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.0E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.0E-01**	30%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.0E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**6.5E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	8.8E-10	0%
Nickel	Sum of all pathways	=	3.39E-12	0%	Sum of all pathways	=	1.4E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	4.0E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	3.8E-04	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	8.9E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-03	0%
Tin	Sum of all pathways	=	NA		Sum of all pathways	=	6.0E-04	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.9E-01**	13%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02	1%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	2.7E-07	0%
Bis(2-ethylhexyl) phthalate	Sum of all pathways	=	7.87E-08	0%	Sum of all pathways	=	3.3E-03	0%
Di-n-butylphthalate	Sum of all pathways	=	NA		Sum of all pathways	=	2.5E-04	0%
Methylene chloride	Sum of all pathways	=	5.74E-12	0%	Sum of all pathways	=	5.6E-06	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	9.2E-08	0%
beta-BHC	Sum of all pathways	=	1.13E-07	1%	Sum of all pathways	=	**NA**	
Aroclor-1260	Sum of all pathways	=	1.37E-07	1%	Sum of all pathways	=	**NA**	

Total Carcinogenic Risk		
All Pathways and Chemicals	=	**1.73E-05**

Total Noncarcinogenic Risk		
All Pathways and Chemicals	=	**3.04E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.80E-02	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	5.25E-07	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.25E-05	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	1.70E-04	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	3.75E-07	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	7.44E-06	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.40E-05	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	2.25E-05	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	3.17E-05	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	7.56E-06	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	5.55E-02	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.94E-05	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	8.76E-04	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	2.89E-08	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.36E-05	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	8.51E-05	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	1.14E-05	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	1.50E-06	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Silver	1.49E-07	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	7.99E-05	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.41E-06	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.38E-04	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	1.04E-04	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	1.37E-08	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	2.29E-07	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
2-Hexanone	5.94E-09	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	3.00E-09	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	1.27E-09	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.10E-01	=	[	8.39E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	6.13E-06	=	[	2.45E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.46E-04	=	[	5.83E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	1.98E-03	=	[	7.92E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	4.38E-06	=	[	1.75E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	8.68E-05	=	[	3.47E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.80E-04	=	[	1.12E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.63E-04	=	[	1.05E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.70E-04	=	[	1.48E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	8.83E-05	=	[	3.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	6.48E-01	=	[	2.59E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.26E-04	=	[	9.05E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	1.02E-02	=	[	4.09E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	3.38E-07	=	[	1.35E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	2.75E-04	=	[	1.10E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	9.93E-04	=	[	3.97E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	1.33E-04	=	[	5.31E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	1.75E-05	=	[	7.01E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Silver	1.74E-06	=	[	6.94E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	9.33E-04	=	[	3.73E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.65E-05	=	[	6.60E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.61E-03	=	[	6.42E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.22E-03	=	[	4.86E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	1.60E-07	=	[	6.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	2.68E-06	=	[	1.07E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
2-Hexanone	6.93E-08	=	[	2.77E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	3.50E-08	=	[	1.40E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	1.48E-08	=	[	5.92E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.85E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	2.88E-10	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	6.85E-09	=	[	8.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	9.30E-08	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.05E-10	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cadmium	4.07E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.32E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.23E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.74E-08	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	4.14E-09	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	3.04E-05	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.06E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.80E-07	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	1.59E-11	=	[	1.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.29E-08	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	4.66E-08	=	[	5.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	6.23E-09	=	[	7.3E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	8.23E-10	=	[	9.6E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Silver	8.15E-11	=	[	9.5E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	4.38E-08	=	[	5.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.75E-10	=	[	9.0E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	7.54E-08	=	[	8.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.71E-08	=	[	6.7E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.51E-12	=	[	8.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Butylbenzylphthalate	1.26E-10	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
2-Hexanone	3.25E-12	=	[	3.8E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Methylene chloride	1.64E-12	=	[	1.9E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	6.95E-13	=	[	8.1E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

NONCARCINOGENIC EFFECTS

Equation Units	EC ug/m^3	=	[	CA ug/m^3	x	EF days/year	x	ET hrs/day	x	ED years	]	/	[(	AT days	x	CF2 hrs/day	)]
NONCARCINOGENIC EFFECTS																	
Aluminum	1.15E-04	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.36E-09	=	[	3.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	7.99E-08	=	[	8.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.08E-06	=	[	1.1E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	2.40E-09	=	[	2.4E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cadmium	4.75E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.53E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.44E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	2.03E-07	=	[	2.0E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	4.84E-08	=	[	4.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.55E-04	=	[	3.5E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.24E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	5.60E-06	=	[	5.6E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	1.85E-10	=	[	1.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.51E-07	=	[	1.5E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	5.44E-07	=	[	5.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	7.27E-08	=	[	7.3E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	9.60E-09	=	[	9.6E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Silver	9.51E-10	=	[	9.5E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	5.11E-07	=	[	5.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	9.04E-09	=	[	9.0E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	8.79E-07	=	[	8.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.66E-07	=	[	6.7E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.77E-11	=	[	8.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Butylbenzylphthalate	1.47E-09	=	[	1.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
2-Hexanone	3.79E-11	=	[	3.8E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Methylene chloride	1.92E-11	=	[	1.9E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	8.11E-12	=	[	8.1E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident

Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area R

Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	5.25E-07	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cadmium	1.04E-08	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Butylbenzylphthalate	3.21E-08	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	25,550	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.39E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.45E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	6.12E-06	=	[	5.83E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	7.92E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	1.75E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cadmium	1.21E-07	=	[	3.47E+00	x	1.00E-06	x	2,800	x	0.2	x	0.001	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.12E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	1.05E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.48E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	3.53E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.59E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	9.05E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	4.09E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	1.35E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	1.10E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	3.97E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	5.31E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	0.00E+00	=	[	7.01E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Silver	NA	=	[	6.94E-02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	3.73E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	6.60E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	6.42E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	4.86E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	0.00E+00	=	[	6.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Butylbenzylphthalate	3.75E-07	=	[	1.07E-01	x	1.00E-06	x	2,800	x	0.2	x	0.1	x	1	x	365	x	6	]	/	[	16	x	2,190	]
2-Hexanone	0.00E+00	=	[	2.77E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Methylene chloride	0.00E+00	=	[	1.40E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	5.92E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor

EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area R
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.80E-02	x	0.00E+00	=	0.00E+00	2.10E-01	/	1.00E+00	=	2.10E-01
Antimony	5.25E-07	x	0.00E+00	=	0.00E+00	6.13E-06	/	4.00E-04	=	1.53E-02
Arsenic	1.25E-05	x	1.50E+00	=	1.87E-05	1.46E-04	/	3.00E-04	=	4.86E-01
Barium	1.70E-04	x	0.00E+00	=	0.00E+00	1.98E-03	/	2.00E-01	=	9.90E-03
Beryllium	3.75E-07	x	0.00E+00	=	0.00E+00	4.38E-06	/	2.00E-03	=	2.19E-03
Cadmium	7.44E-06	x	0.00E+00	=	0.00E+00	8.68E-05	/	1.00E-03	=	8.68E-02
Chromium	2.40E-05	x	0.00E+00	=	0.00E+00	2.80E-04	/	3.00E-03	=	9.33E-02
Cobalt	2.25E-05	x	0.00E+00	=	0.00E+00	2.63E-04	/	3.00E-04	=	8.75E-01
Copper	3.17E-05	x	0.00E+00	=	0.00E+00	3.70E-04	/	4.00E-02	=	9.25E-03
Fluoride	7.56E-06	x	0.00E+00	=	0.00E+00	8.83E-05	/	4.00E-02	=	2.21E-03
Iron	5.55E-02	x	0.00E+00	=	0.00E+00	6.48E-01	/	7.00E-01	=	9.25E-01
Lithium	1.94E-05	x	0.00E+00	=	0.00E+00	2.26E-04	/	2.00E-03	=	1.13E-01
Manganese	8.76E-04	x	0.00E+00	=	0.00E+00	1.02E-02	/	1.40E-01	=	7.30E-02
Mercury	2.89E-08	x	0.00E+00	=	0.00E+00	3.38E-07	/	0.00E+00	=	NA
Nickel	2.36E-05	x	0.00E+00	=	0.00E+00	2.75E-04	/	2.00E-02	=	1.38E-02
Nitrate	8.51E-05	x	0.00E+00	=	0.00E+00	9.93E-04	/	7.10E+00	=	1.40E-04
Nitrite	1.14E-05	x	0.00E+00	=	0.00E+00	1.33E-04	/	3.00E-01	=	4.43E-04
Selenium	1.50E-06	x	0.00E+00	=	0.00E+00	1.75E-05	/	5.00E-03	=	3.51E-03
Silver	1.49E-07	x	0.00E+00	=	0.00E+00	1.74E-06	/	5.00E-03	=	3.47E-04
Strontium	7.99E-05	x	0.00E+00	=	0.00E+00	9.33E-04	/	6.00E-01	=	1.55E-03
Total Uranium	1.41E-06	x	0.00E+00	=	0.00E+00	1.65E-05	/	3.00E-03	=	5.50E-03
Vanadium	1.38E-04	x	0.00E+00	=	0.00E+00	1.61E-03	/	5.00E-03	=	3.21E-01
Zinc	1.04E-04	x	0.00E+00	=	0.00E+00	1.22E-03	/	3.00E-01	=	4.05E-03
Acetone	1.37E-08	x	0.00E+00	=	0.00E+00	1.60E-07	/	9.00E-01	=	1.78E-07
Butylbenzylphthalate	2.29E-07	x	1.90E-03	=	4.36E-10	2.68E-06	/	2.00E-01	=	1.34E-05
2-Hexanone	5.94E-09	x	0.00E+00	=	0.00E+00	6.93E-08	/	5.00E-03	=	1.39E-05
Methylene chloride	3.00E-09	x	2.00E-03	=	6.00E-12	3.50E-08	/	6.00E-03	=	5.83E-06
Toluene	1.27E-09	x	0.00E+00	=	0.00E+00	1.48E-08	/	8.00E-02	=	1.85E-07
			Pathway total	=	1.87E-05			Pathway total	=	3.25E+00

Inhalation of Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects						
	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.85E-06	x		=	NA	1.15E-04	/[	5.00E-03	x	1000	]=	2.30E-05
Antimony	2.88E-10	x		=	NA	3.36E-09	/[		x	1000	]=	NA
Arsenic	6.85E-09	x	4.30E-03	=	2.94E-11	7.99E-08	/[	1.50E-05	x	1000	]=	5.32E-06
Barium	9.30E-08	x		=	NA	1.08E-06	/[	5.00E-04	x	1000	]=	2.17E-06
Beryllium	2.05E-10	x	2.40E-03	=	4.93E-13	2.40E-09	/[	2.00E-05	x	1000	]=	1.20E-07
Cadmium	4.07E-09	x	1.80E-03	=	7.33E-12	4.75E-08	/[	1.00E-05	x	1000	]=	4.75E-06
Chromium	1.32E-08	x	8.40E-02	=	1.10E-09	1.53E-07	/[	1.00E-04	x	1000	]=	1.53E-06
Cobalt	1.23E-08	x	9.00E-03	=	1.11E-10	1.44E-07	/[	6.00E-06	x	1000	]=	2.40E-05
Copper	1.74E-08	x		=	NA	2.03E-07	/[		x	1000	]=	NA
Fluoride	4.14E-09	x		=	NA	4.84E-08	/[	1.30E-02	x	1000	]=	3.72E-09
Iron	3.04E-05	x		=	NA	3.55E-04	/[		x	1000	]=	NA
Lithium	1.06E-08	x		=	NA	1.24E-07	/[		x	1000	]=	NA
Manganese	4.80E-07	x		=	NA	5.60E-06	/[	5.00E-05	x	1000	]=	1.12E-04
Mercury	1.59E-11	x	0.00E+00	=	0.00E+00	1.85E-10	/[	3.00E-04	x	1000	]=	6.16E-10
Nickel	1.29E-08	x	2.60E-04	=	3.36E-12	1.51E-07	/[	9.00E-05	x	1000	]=	1.67E-06
Nitrate	4.66E-08	x		=	NA	5.44E-07	/[		x	1000	]=	NA
Nitrite	6.23E-09	x		=	NA	7.27E-08	/[		x	1000	]=	NA
Selenium	8.23E-10	x	0.00E+00	=	0.00E+00	9.60E-09	/[	2.00E-02	x	1000	]=	4.80E-10
Silver	8.15E-11	x		=	NA	9.51E-10	/[		x	1000	]=	NA
Strontium	4.38E-08	x		=	NA	5.11E-07	/[		x	1000	]=	NA
Total Uranium	7.75E-10	x		=	NA	9.04E-09	/[	4.00E-05	x	1000	]=	2.26E-07
Vanadium	7.54E-08	x		=	NA	8.79E-07	/[	1.00E-04	x	1000	]=	8.79E-06
Zinc	5.71E-08	x		=	NA	6.66E-07	/[		x	1000	]=	NA
Acetone	7.51E-12	x	0.00E+00	=	0.00E+00	8.77E-11	/[	3.10E+01	x	1000	]=	2.83E-15
Butylbenzylphthalate	1.26E-10	x	0.00E+00	=	0.00E+00	1.47E-09	/[		x	1000	]=	NA
2-Hexanone	3.25E-12	x	0.00E+00	=	0.00E+00	3.79E-11	/[	3.00E-02	x	1000	]=	1.26E-12
Methylene chloride	1.64E-12	x	1.00E-08	=	1.64E-20	1.92E-11	/[	6.00E-01	x	1000	]=	3.20E-14
Toluene	6.95E-13	x	0.00E+00	=	0.00E+00	8.11E-12	/	5.00E+00	x	1000	]=	1.62E-15
			Pathway total =		1.26E-09					Pathway total =		1.84E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	5.25E-07	x	1.50E+00	=	7.87E-07	6.12E-06	/	3.00E-04	=	2.04E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Cadmium	1.04E-08	x		=	NA	1.21E-07	/	2.50E-05	=	4.86E-03
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Silver	NA	x		=	NA	NA	/	2.00E-04	=	NA
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Butylbenzylphthalate	3.21E-08	x	1.90E-03	=	6.10E-11	3.75E-07	/	2.00E-01	=	1.87E-06
2-Hexanone	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Methylene chloride	0.00E+00	x	2.00E-03	=	0.00E+00	0.00E+00	/	6.00E-03	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		7.87E-07			Pathway total =		2.53E-02

Chemical Totals

	Carcinogenic Effects			% Cont	Noncarcinogenic Effects			% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.1E-01**	6%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.5E-02	0%
Arsenic	Sum of all pathways	=	1.95E-05	100%	Sum of all pathways	=	**5.1E-01**	15%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	9.9E-03	0%
Beryllium	Sum of all pathways	=	4.93E-13	0%	Sum of all pathways	=	2.2E-03	0%
Cadmium	Sum of all pathways	=	7.33E-12	0%	Sum of all pathways	=	**9.2E-02**	3%
Chromium	Sum of all pathways	=	1.10E-09	0%	Sum of all pathways	=	**9.3E-02**	3%
Cobalt	Sum of all pathways	=	1.11E-10	0%	Sum of all pathways	=	**8.8E-01**	27%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	9.3E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	2.2E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**9.3E-01**	28%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.1E-01**	3%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**7.3E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	6.2E-10	0%
Nickel	Sum of all pathways	=	3.36E-12	0%	Sum of all pathways	=	1.4E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-04	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	4.4E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-03	0%
Silver	Sum of all pathways	=	NA		Sum of all pathways	=	3.5E-04	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	1.6E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.5E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**3.2E-01**	10%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	4.1E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-07	0%
Butylbenzylphthalate	Sum of all pathways	=	4.97E-10	0%	Sum of all pathways	=	1.5E-05	0%
2-Hexanone	Sum of all pathways	=	NA		Sum of all pathways	=	1.4E-05	0%
Methylene chloride	Sum of all pathways	=	6.00E-12	0%	Sum of all pathways	=	5.8E-06	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	1.9E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**1.95E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**3.28E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Ingestion of Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	CDIingestion	=	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	
CARCINOGENIC EFFECTS																					
Aluminum	1.77E-02	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	6.24E-07	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	1.50E-05	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Barium	2.08E-04	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	5.04E-07	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Boron	1.38E-05	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	2.14E-05	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	1.87E-05	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Copper	2.83E-05	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	4.33E-06	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Iron	4.95E-02	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	1.98E-05	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	7.80E-04	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	4.41E-08	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	5.42E-06	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	2.10E-05	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	1.82E-05	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	4.69E-06	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	4.29E-06	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	1.06E-04	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	1.32E-06	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	1.11E-04	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	9.71E-05	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	1.32E-08	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Benzene	7.03E-10	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	8.08E-10	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	1.58E-09	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	25,550	]

Equation	CDIingestion =	[	C_S	x	IR_S	x	FI	x	CF1	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day		mg/kg		mg soil/day		unitless		kg/mg		days/year		years				kg		days	

NONCARCINOGENIC EFFECTS

Aluminum	2.07E-01	=	[	8.27E+03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	7.28E-06	=	[	2.91E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	1.75E-04	=	[	7.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Barium	2.42E-03	=	[	9.69E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	5.88E-06	=	[	2.35E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Boron	1.61E-04	=	[	6.42E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	2.50E-04	=	[	1.00E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	2.18E-04	=	[	8.73E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Copper	3.30E-04	=	[	1.32E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	5.05E-05	=	[	2.02E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Iron	5.78E-01	=	[	2.31E+04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	2.31E-04	=	[	9.24E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	9.10E-03	=	[	3.64E+02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	5.15E-07	=	[	2.06E-02	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	6.33E-05	=	[	2.53E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	2.45E-04	=	[	9.80E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	2.13E-04	=	[	8.51E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	5.48E-05	=	[	2.19E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	5.00E-05	=	[	2.00E+00	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	1.24E-03	=	[	4.96E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	1.54E-05	=	[	6.18E-01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	1.30E-03	=	[	5.19E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	1.13E-03	=	[	4.53E+01	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	1.55E-07	=	[	6.18E-03	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Benzene	8.20E-09	=	[	3.28E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	9.43E-09	=	[	3.77E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	1.85E-08	=	[	7.38E-04	x	400	x	1	x	1.00E-06	x	365	x	6	]	/	[	16	x	2,190	]

CDIingestion = chronic daily chemical intake via soil ingestion
CS = chemical concentration in soil
IR = soil ingestion rate
FI = fraction of intake
CF1 = conversion factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Daily Intake Calculations: Child Yakama Resident
Inhalation of Chemicals in Shallow Vadose Zone Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
CARCINOGENIC EFFECTS																	
Aluminum	9.71E-06	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Antimony	3.42E-10	=	[	4.0E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Arsenic	8.22E-09	=	[	9.6E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Barium	1.14E-07	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Beryllium	2.76E-10	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Boron	7.54E-09	=	[	8.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Chromium	1.17E-08	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Cobalt	1.03E-08	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Copper	1.55E-08	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Fluoride	2.37E-09	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Iron	2.71E-05	=	[	3.2E-04	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Lithium	1.08E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Manganese	4.27E-07	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Mercury	2.42E-11	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Molybdenum	2.97E-09	=	[	3.5E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nickel	1.15E-08	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrate	9.99E-09	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Nitrite	2.57E-09	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Selenium	2.35E-09	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Strontium	5.82E-08	=	[	6.8E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Total Uranium	7.25E-10	=	[	8.5E-09	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Vanadium	6.09E-08	=	[	7.1E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Zinc	5.32E-08	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Acetone	7.26E-12	=	[	8.5E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Benzene	3.85E-13	=	[	4.5E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Styrene	4.43E-13	=	[	5.2E-12	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]
Toluene	8.67E-13	=	[	1.0E-11	x	365	x	24.0	x	6	]	/	[(	25,550	x	24	)]

Equation	EC	=	[	CA	x	EF	x	ET	x	ED	]	/	[(	AT	x	CF2	)]
Units	ug/m^3			ug/m^3		days/year		hrs/day		years				days		hrs/day	
NONCARCINOGENIC EFFECTS																	
Aluminum	1.13E-04	=	[	1.1E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Antimony	3.99E-09	=	[	4.0E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Arsenic	9.59E-08	=	[	9.6E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Barium	1.33E-06	=	[	1.3E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Beryllium	3.22E-09	=	[	3.2E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Boron	8.79E-08	=	[	8.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Chromium	1.37E-07	=	[	1.4E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Cobalt	1.20E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Copper	1.81E-07	=	[	1.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Fluoride	2.77E-08	=	[	2.8E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Iron	3.16E-04	=	[	3.2E-04	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Lithium	1.27E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Manganese	4.99E-06	=	[	5.0E-06	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Mercury	2.82E-10	=	[	2.8E-10	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Molybdenum	3.47E-08	=	[	3.5E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nickel	1.34E-07	=	[	1.3E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrate	1.17E-07	=	[	1.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Nitrite	3.00E-08	=	[	3.0E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Selenium	2.74E-08	=	[	2.7E-08	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Strontium	6.79E-07	=	[	6.8E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Total Uranium	8.46E-09	=	[	8.5E-09	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Vanadium	7.11E-07	=	[	7.1E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Zinc	6.21E-07	=	[	6.2E-07	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Acetone	8.47E-11	=	[	8.5E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Benzene	4.49E-12	=	[	4.5E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Styrene	5.16E-12	=	[	5.2E-12	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]
Toluene	1.01E-11	=	[	1.0E-11	x	365	x	24.0	x	6	]	/	[(	2,190	x	24	)]

EC = Exposure concentration of chemical
CA = chemical concentration in air
CF2 = conversion factor
EF = exposure frequency
ET = exposure time
ED = exposure duration
AT = averaging time

RPP-RPT-58329, Rev. 3

Daily Intake Calculations: Child Yakama Resident
Dermal Contact with Chemicals in Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
CARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Arsenic	6.30E-07	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	25,550	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0	x	1	x	365	x	6	]	/	[	16	x	25,550	]

Equation	DAD_{dermal}	=	[	C_S	x	CF3	x	SA	x	AF	x	ABS	x	EV	x	EF	x	ED	]	/	[	BW	x	AT	]
Units	mg/kg-day			mg/kg		kg/mg		cm^2		mg/cm^2-event		unitless		Events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																									
Aluminum	NA	=	[	8.27E+03	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Antimony	NA	=	[	2.91E-01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Arsenic	7.35E-06	=	[	7.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.03	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Barium	NA	=	[	9.69E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Beryllium	0.00E+00	=	[	2.35E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Boron	0.00E+00	=	[	6.42E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Chromium	NA	=	[	1.00E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Cobalt	NA	=	[	8.73E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Copper	NA	=	[	1.32E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Fluoride	NA	=	[	2.02E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Iron	NA	=	[	2.31E+04	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Lithium	NA	=	[	9.24E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Manganese	NA	=	[	3.64E+02	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Mercury	0.00E+00	=	[	2.06E-02	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Molybdenum	0.00E+00	=	[	2.53E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nickel	NA	=	[	9.80E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrate	NA	=	[	8.51E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Nitrite	NA	=	[	2.19E+00	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Selenium	0.00E+00	=	[	2.00E+00	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Strontium	NA	=	[	4.96E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Total Uranium	0.00E+00	=	[	6.18E-01	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Vanadium	NA	=	[	5.19E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Zinc	NA	=	[	4.53E+01	x	1.00E-06	x	2,800	x	0.2	x		x	1	x	365	x	6	]	/	[	16	x	2,190	]
Acetone	0.00E+00	=	[	6.18E-03	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Benzene	0.00E+00	=	[	3.28E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Styrene	0.00E+00	=	[	3.77E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]
Toluene	0.00E+00	=	[	7.38E-04	x	1.00E-06	x	2,800	x	0.2	x	0.00	x	1	x	365	x	6	]	/	[	16	x	2,190	]

DAD_{dermal} = daily absorbed chemical dose
CS = chemical concentration in soil
CF3 = conversion factor
SA = skin surface area available for contact
AF =soil to skin adherence factor
ABS = absorption factor
EV = Event Frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Risk Characterization
Child Yakama Resident Exposed to Shallow Vadose Soil (upto 15 ft) - Exposure Area U
Waste Management Area C

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**CDI**	**x**	**CSFo**	**=**	**CR**	**CDI**	**/**	**RfDo**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Ingestion of Chemicals in Soil										
Aluminum	1.77E-02	x	0.00E+00	=	0.00E+00	2.07E-01	/	1.00E+00	=	2.07E-01
Antimony	6.24E-07	x	0.00E+00	=	0.00E+00	7.28E-06	/	4.00E-04	=	1.82E-02
Arsenic	1.50E-05	x	1.50E+00	=	2.25E-05	1.75E-04	/	3.00E-04	=	5.83E-01
Barium	2.08E-04	x	0.00E+00	=	0.00E+00	2.42E-03	/	2.00E-01	=	1.21E-02
Beryllium	5.04E-07	x	0.00E+00	=	0.00E+00	5.88E-06	/	2.00E-03	=	2.94E-03
Boron	1.38E-05	x	0.00E+00	=	0.00E+00	1.61E-04	/	2.00E-01	=	8.03E-04
Chromium	2.14E-05	x	0.00E+00	=	0.00E+00	2.50E-04	/	3.00E-03	=	8.33E-02
Cobalt	1.87E-05	x	0.00E+00	=	0.00E+00	2.18E-04	/	3.00E-04	=	7.28E-01
Copper	2.83E-05	x	0.00E+00	=	0.00E+00	3.30E-04	/	4.00E-02	=	8.25E-03
Fluoride	4.33E-06	x	0.00E+00	=	0.00E+00	5.05E-05	/	4.00E-02	=	1.26E-03
Iron	4.95E-02	x	0.00E+00	=	0.00E+00	5.78E-01	/	7.00E-01	=	8.25E-01
Lithium	1.98E-05	x	0.00E+00	=	0.00E+00	2.31E-04	/	2.00E-03	=	1.16E-01
Manganese	7.80E-04	x	0.00E+00	=	0.00E+00	9.10E-03	/	1.40E-01	=	6.50E-02
Mercury	4.41E-08	x	0.00E+00	=	0.00E+00	5.15E-07	/	0.00E+00	=	NA
Molybdenum	5.42E-06	x	0.00E+00	=	0.00E+00	6.33E-05	/	5.00E-03	=	1.27E-02
Nickel	2.10E-05	x	0.00E+00	=	0.00E+00	2.45E-04	/	2.00E-02	=	1.23E-02
Nitrate	1.82E-05	x	0.00E+00	=	0.00E+00	2.13E-04	/	7.10E+00	=	3.00E-05
Nitrite	4.69E-06	x	0.00E+00	=	0.00E+00	5.48E-05	/	3.00E-01	=	1.83E-04
Selenium	4.29E-06	x	0.00E+00	=	0.00E+00	5.00E-05	/	5.00E-03	=	1.00E-02
Strontium	1.06E-04	x	0.00E+00	=	0.00E+00	1.24E-03	/	6.00E-01	=	2.07E-03
Total Uranium	1.32E-06	x	0.00E+00	=	0.00E+00	1.54E-05	/	3.00E-03	=	5.15E-03
Vanadium	1.11E-04	x	0.00E+00	=	0.00E+00	1.30E-03	/	5.00E-03	=	2.60E-01
Zinc	9.71E-05	x	0.00E+00	=	0.00E+00	1.13E-03	/	3.00E-01	=	3.78E-03
Acetone	1.32E-08	x	0.00E+00	=	0.00E+00	1.55E-07	/	9.00E-01	=	1.72E-07
Benzene	7.03E-10	x	5.50E-02	=	3.87E-11	8.20E-09	/	4.00E-03	=	2.05E-06
Styrene	8.08E-10	x	0.00E+00	=	0.00E+00	9.43E-09	/	2.00E-01	=	4.71E-08
Toluene	1.58E-09	x	0.00E+00	=	0.00E+00	1.85E-08	/	8.00E-02	=	2.31E-07
			Pathway total	=	2.25E-05			Pathway total	=	2.96E+00

Inhalation of Chemicals in Soil

Equation	EC	x	IUR	=	CR	EC	/[	Rfc	x	CF	]=	HQ
Units	ug/m^3		(ug/m^3)$^{-1}$		unitless	ug/m^3		ug/m^3		ug/mg		unitless
Aluminum	9.71E-06	x		=	NA	1.13E-04	/[	5.00E-03	x	1000	]=	2.27E-05
Antimony	3.42E-10	x		=	NA	3.99E-09	/[		x	1000	]=	NA
Arsenic	8.22E-09	x	4.30E-03	=	3.53E-11	9.59E-08	/[	1.50E-05	x	1000	]=	6.39E-06
Barium	1.14E-07	x		=	NA	1.33E-06	/[	5.00E-04	x	1000	]=	2.65E-06
Beryllium	2.76E-10	x	2.40E-03	=	6.62E-13	3.22E-09	/[	2.00E-05	x	1000	]=	1.61E-07
Boron	7.54E-09	x	0.00E+00	=	0.00E+00	8.79E-08	/[	2.00E-02	x	1000	]=	4.40E-09
Chromium	1.17E-08	x	8.40E-02	=	9.86E-10	1.37E-07	/[	1.00E-04	x	1000	]=	1.37E-06
Cobalt	1.03E-08	x	9.00E-03	=	9.23E-11	1.20E-07	/[	6.00E-06	x	1000	]=	1.99E-05
Copper	1.55E-08	x		=	NA	1.81E-07	/[		x	1000	]=	NA
Fluoride	2.37E-09	x		=	NA	2.77E-08	/[	1.30E-02	x	1000	]=	2.13E-09
Iron	2.71E-05	x		=	NA	3.16E-04	/[		x	1000	]=	NA
Lithium	1.08E-08	x		=	NA	1.27E-07	/[		x	1000	]=	NA
Manganese	4.27E-07	x		=	NA	4.99E-06	/[	5.00E-05	x	1000	]=	9.97E-05
Mercury	2.42E-11	x	0.00E+00	=	0.00E+00	2.82E-10	/[	3.00E-04	x	1000	]=	9.41E-10
Molybdenum	2.97E-09	x	0.00E+00	=	0.00E+00	3.47E-08	/[	0.00E+00	x	1000	]=	NA
Nickel	1.15E-08	x	2.60E-04	=	2.99E-12	1.34E-07	/[	9.00E-05	x	1000	]=	1.49E-06
Nitrate	9.99E-09	x		=	NA	1.17E-07	/[		x	1000	]=	NA
Nitrite	2.57E-09	x		=	NA	3.00E-08	/[		x	1000	]=	NA
Selenium	2.35E-09	x	0.00E+00	=	0.00E+00	2.74E-08	/[	2.00E-02	x	1000	]=	1.37E-09
Strontium	5.82E-08	x		=	NA	6.79E-07	/[		x	1000	]=	NA
Total Uranium	7.25E-10	x		=	NA	8.46E-09	/[	4.00E-05	x	1000	]=	2.11E-07
Vanadium	6.09E-08	x		=	NA	7.11E-07	/[	1.00E-04	x	1000	]=	7.11E-06
Zinc	5.32E-08	x		=	NA	6.21E-07	/[		x	1000	]=	NA
Acetone	7.26E-12	x	0.00E+00	=	0.00E+00	8.47E-11	/[	3.10E+01	x	1000	]=	2.73E-15
Benzene	3.85E-13	x	7.80E-06	=	3.00E-18	4.49E-12	/[	3.00E-02	x	1000	]=	1.50E-13
Styrene	4.43E-13	x	0.00E+00	=	0.00E+00	5.16E-12	/[	1.00E+00	x	1000	]=	5.16E-15
Toluene	8.67E-13	x	0.00E+00	=	0.00E+00	1.01E-11	/[	5.00E+00	x	1000	]=	2.02E-15
			Pathway total =		1.12E-09					Pathway total =		1.62E-04

Dermal Contact with Chemicals in Soil

	Carcinogenic Effects					Noncarcinogenic Effects				
Equation	**DAD**	**x**	**SF_{ABS}**	**=**	**CR**	**DAD**	**/**	**RfD_{ABS}**	**=**	**HQ**
Units	**mg/kg-day**		**(mg/kg-day)-1**		**unitless**	**mg/kg-day**		**mg/kg-day**		**unitless**
Aluminum	NA	x	0.00E+00	=	NA	NA	/	1.00E+00	=	NA
Antimony	NA	x	0.00E+00	=	NA	NA	/	6.00E-05	=	NA
Arsenic	6.30E-07	x	1.50E+00	=	9.45E-07	7.35E-06	/	3.00E-04	=	2.45E-02
Barium	NA	x		=	NA	NA	/	1.40E-02	=	NA
Beryllium	0.00E+00	x		=	NA	0.00E+00	/	1.40E-05	=	0.00E+00
Boron	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Chromium	NA	x		=	NA	NA	/	7.50E-05	=	NA
Cobalt	NA	x		=	NA	NA	/	3.00E-04	=	NA
Copper	NA	x		=	NA	NA	/	4.00E-02	=	NA
Fluoride	NA	x		=	NA	NA	/	4.00E-02	=	NA
Iron	NA	x		=	NA	NA	/	7.00E-01	=	NA
Lithium	NA	x		=	NA	NA	/	2.00E-03	=	NA
Manganese	NA	x		=	NA	NA	/	1.40E-01	=	NA
Mercury	0.00E+00	x		=	NA	0.00E+00	/		=	NA
Molybdenum	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Nickel	NA	x		=	NA	NA	/	8.00E-04	=	NA
Nitrate	NA	x		=	NA	NA	/	7.10E+00	=	NA
Nitrite	NA	x		=	NA	NA	/	3.00E-01	=	NA
Selenium	0.00E+00	x		=	NA	0.00E+00	/	5.00E-03	=	0.00E+00
Strontium	NA	x		=	NA	NA	/	6.00E-01	=	NA
Total Uranium	0.00E+00	x		=	NA	0.00E+00	/	3.00E-03	=	0.00E+00
Vanadium	NA	x		=	NA	NA	/	1.30E-04	=	NA
Zinc	NA	x		=	NA	NA	/	3.00E-01	=	NA
Acetone	0.00E+00	x		=	NA	0.00E+00	/	0.00E+00	=	NA
Benzene	0.00E+00	x	5.50E-02	=	0.00E+00	0.00E+00	/	4.00E-03	=	0.00E+00
Styrene	0.00E+00	x		=	NA	0.00E+00	/	2.00E-01	=	0.00E+00
Toluene	0.00E+00	x		=	NA	0.00E+00	/	8.00E-02	=	0.00E+00
			Pathway total =		9.45E-07			Pathway total =		2.45E-02

RPP-RPT-58329, Rev. 3

Chemical Totals

			Carcinogenic Effects	% Con			Noncarcinogenic Effects	% Cont
Aluminum	Sum of all pathways	=	NA		Sum of all pathways	=	**2.1E-01**	7%
Antimony	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-02	1%
Arsenic	Sum of all pathways	=	2.34E-05	100%	Sum of all pathways	=	**6.1E-01**	20%
Barium	Sum of all pathways	=	NA		Sum of all pathways	=	1.2E-02	0%
Beryllium	Sum of all pathways	=	6.62E-13	0%	Sum of all pathways	=	2.9E-03	0%
Boron	Sum of all pathways	=	NA		Sum of all pathways	=	8.0E-04	0%
Chromium	Sum of all pathways	=	9.86E-10	0%	Sum of all pathways	=	**8.3E-02**	3%
Cobalt	Sum of all pathways	=	9.23E-11	0%	Sum of all pathways	=	**7.3E-01**	24%
Copper	Sum of all pathways	=	NA		Sum of all pathways	=	8.3E-03	0%
Fluoride	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-03	0%
Iron	Sum of all pathways	=	NA		Sum of all pathways	=	**8.3E-01**	28%
Lithium	Sum of all pathways	=	NA		Sum of all pathways	=	**1.2E-01**	4%
Manganese	Sum of all pathways	=	NA		Sum of all pathways	=	**6.5E-02**	2%
Mercury	Sum of all pathways	=	NA		Sum of all pathways	=	9.4E-10	0%
Molybdenum	Sum of all pathways	=	NA		Sum of all pathways	=	1.3E-02	0%
Nickel	Sum of all pathways	=	2.99E-12	0%	Sum of all pathways	=	1.2E-02	0%
Nitrate	Sum of all pathways	=	NA		Sum of all pathways	=	3.0E-05	0%
Nitrite	Sum of all pathways	=	NA		Sum of all pathways	=	1.8E-04	0%
Selenium	Sum of all pathways	=	NA		Sum of all pathways	=	1.0E-02	0%
Strontium	Sum of all pathways	=	NA		Sum of all pathways	=	2.1E-03	0%
Total Uranium	Sum of all pathways	=	NA		Sum of all pathways	=	5.1E-03	0%
Vanadium	Sum of all pathways	=	NA		Sum of all pathways	=	**2.6E-01**	9%
Zinc	Sum of all pathways	=	NA		Sum of all pathways	=	3.8E-03	0%
Acetone	Sum of all pathways	=	NA		Sum of all pathways	=	1.7E-07	0%
Benzene	Sum of all pathways	=	3.87E-11	0%	Sum of all pathways	=	2.1E-06	0%
Styrene	Sum of all pathways	=	NA		Sum of all pathways	=	4.7E-08	0%
Toluene	Sum of all pathways	=	NA		Sum of all pathways	=	2.3E-07	0%

Total Carcinogenic Risk All Pathways and Chemicals	=	**2.34E-05**

Total Noncarcinogenic Risk All Pathways and Chemicals	=	**2.98E+00**

DI = Chemical Daily Intake; from Tables
SF = Cancer Slope Factor; from Tables
CR = Cancer Risk
RfD = Noncancer Reference Dose; from Tables
NA = not applicable

Bold indicates risk exceeding the de-minimis level: greater than 1E-05 for carcinogenic risks and greater than 1E+00 for noncaner risks.

Nonradiological Risk Assessment Results for Child Yakama Resident

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Nonradiological COPCs										
Soil Ingestion	1E-05	7E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	2E-05
Inhalation	1E-09	1E-09	2E-09	1E-09	2E-09	1E-09	1E-09	1E-09	1E-09	1E-09
Dermal Contact	5E-07	3E-06	7E-07	5E-07	7E-07	1E-06	5E-07	7E-07	8E-07	9E-07
ELCR	1E-05	7E-05	2E-05	1E-05	2E-05	3E-05	1E-05	2E-05	2E-05	2E-05
Risk Contributors	None									
Noncancer Hazard - Nonradiological COPCs										
Soil Ingestion	2.7	4.8	3.0	2.7	3.1	3.2	2.5	3.0	3.3	3.0
Inhalation	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04	2E-04
Dermal Contact	2E-02	8E-02	2E-02	1E-02	2E-02	3E-02	1E-02	2E-02	3E-02	2E-02
HI	**2.8**	**4.9**	**3.0**	**2.7**	**3.1**	**3.2**	**2.5**	**3.0**	**3.3**	**3.0**

APPENDIX D

RADIOLOGICAL RISK ASSESSMENT CALCULATIONS AND SUMMARY REPORTS

Table of Contents

Attachment D-1: Results of Radiological Risk Assessment for CERCLA Industrial Worker D-1

Attachment D-2: Results of Radiological Risk Assessment for CERCLA Construction Worker D-77

Attachment D-3: Results of Radiological Risk Assessment for CERCLA Maintenance/ Surveillance Worker D-157

Attachment D-4: Results of Radiological Risk Assessment for CERCLA Adult Trespasser Receptor D-237

Attachment D-5: Results of Radiological Risk Assessment for CERCLA Youth Trespasser Receptor D-317

Attachment D-6: Results of Radiological Risk Assessment for CERCLA Residential Receptor D-397

Attachment D-7: Results of Radiological Risk Assessment for CTUIR Residential Receptor D-487

Attachment D-8: Results of Radiological Risk Assessment for Yakama Nation Residential Receptor D-584

Output Risk Assessment Summary Report for Yakama Nation Residential Receptor D-616

Appendix D
Attachment D-1: Results of Radiological Risk Assessment for CERCLA Industrial Worker

Table D-1-1: Radiological Risk Assessments For Industrail Worker - EA A plus B

		T=0 Year								% Cont	T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)					RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0.18	8E-08	1E-12	1E-08	9E-08	1.E-08	2.E-13	2.E-09	2.E-08	0%	2E-08	2E-13	3E-09	2E-08	3.E-09	4.E-14	5.E-10	3.E-09
C-14	3.4	6E-13	3E-11	6E-12	3E-11	2.E-12	9.E-11	2.E-11	1.E-10	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	5E-06	3E-15	3E-09	5E-06	1.E-04	8.E-14	8.E-08	2.E-04	**32%**	4E-16	2E-25	2E-19	4E-16	1.E-14	6.E-24	6.E-18	1.E-14
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0%	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0%	2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0%	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	6E-10	2E-12	2E-08	2E-08	2.E-10	6.E-13	6.E-09	6.E-09	0%	5E-10	2E-12	2E-08	2E-08	2.E-10	5.E-13	5.E-09	5.E-09
Pu-241	1.2	1E-09	3E-14	3E-10	1E-09	1.E-09	4.E-14	4.E-10	2.E-09	0%	5E-10	8E-15	9E-11	6E-10	6.E-10	1.E-14	1.E-10	7.E-10
Se-79	2.4	1E-11	3E-16	4E-10	4E-10	3.E-11	6.E-16	1.E-09	1.E-09	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	1E-05	6E-15	2E-09	1E-05	3.E-04	2.E-13	5.E-08	3.E-04	**68%**	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	4E-08	1E-14	7E-09	5E-08	7.E-07	2.E-13	1.E-07	8.E-07	0%	1E-18	3E-25	2E-19	1E-18	2.E-17	6.E-24	4.E-18	2.E-17
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0%	3E-07	1E-12	1E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	3.E-09	3.E-09	0%	4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	2.E-09	1.E-08
U-235	0.0089	2E-06	8E-13	1E-08	2E-06	1.E-08	8.E-15	9.E-11	1.E-08	0%	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	9.E-11	1.E-08
U-238	0.19	3E-07	8E-13	1E-08	3E-07	6.E-08	2.E-13	2.E-09	6.E-08	0%	3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	5.E-08
				Excess Cancer Risk		**5.E-04**	**9.E-11**	**3.E-07**	**5.E-04**				**Excess Cancer Risk**		**7.E-08**	**9.E-13**	**1.E-08**	**8.E-08**

Table D-1-2: Radiological Risk Assessments For Industrail Worker - EA C

		T=0 Year								%	T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				Cont	RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	3E-11	6E-12	3E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	5E-06	3E-15	3E-09	5E-06	4.E-05	2.E-14	2.E-08	4.E-05	7%	4E-16	2E-25	2E-19	4E-16	3.E-15	2.E-24	2.E-18	3.E-15
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	2E-16	9E-11	9E-11	0.E+00	8.E-16	4.E-10	4.E-10		0E+00	9E-20	5E-14	5E-14	0.E+00	4.E-19	2.E-13	2.E-13
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	4E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	1E-05	6E-15	2E-09	1E-05	5.E-04	3.E-13	9.E-08	5.E-04	93%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	4E-08	1E-14	7E-09	5E-08	1.E-07	3.E-14	2.E-08	1.E-07		1E-18	3E-25	2E-19	1E-18	4.E-18	1.E-24	7.E-19	4.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		3E-07	1E-12	1E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	7E-10	9E-13	1E-08	1E-08	0.E+00	0.E+00	0.E+00	0.E+00		4E-08	8E-13	9E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-06	8E-13	1E-08	2E-06	2.E-08	1.E-14	1.E-10	2.E-08		1E-06	8E-13	1E-08	1E-06	2.E-08	1.E-14	1.E-10	2.E-08
U-238	0.28	3E-07	8E-13	1E-08	3E-07	9.E-08	2.E-13	3.E-09	9.E-08		3E-07	6E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08
				Excess Cancer Risk		**6.E-04**	**6.E-13**	**1.E-07**	**6.E-04**				**Excess Cancer Risk**		**9.E-08**	**2.E-13**	**3.E-09**	**9.E-08**

Table D-1-3: Radiological Risk Assessments For Industrail Worker - EA E

		T=0 Year								% Cont	T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)					RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	3E-11	6E-12	3E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	5E-06	3E-15	3E-09	5E-06	3.E-05	1.E-14	1.E-08	3.E-05	13%	4E-16	2E-25	2E-19	4E-16	2.E-15	1.E-24	1.E-18	2.E-15
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	1E-11	3E-16	4E-10	4E-10	5.E-11	1.E-15	2.E-09	2.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	1E-05	6E-15	2E-09	1E-05	2.E-04	1.E-13	3.E-08	2.E-04	87%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	4E-08	1E-14	7E-09	5E-08	1.E-07	3.E-14	2.E-08	1.E-07		1E-18	3E-25	2E-19	1E-18	3.E-18	8.E-25	6.E-19	4.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	3.E-08		3E-07	1E-12	1E-08	3E-07	5.E-07	3.E-12	3.E-08	6.E-07
U-234	0.45	7E-10	9E-13	1E-08	1E-08	3.E-10	4.E-13	4.E-09	5.E-09		4E-08	8E-13	9E-09	5E-08	2.E-08	3.E-13	4.E-09	2.E-08
U-235	0.0012	2E-06	8E-13	1E-08	2E-06	2.E-09	1.E-15	1.E-11	2.E-09		1E-06	8E-13	1E-08	1E-06	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.28	3E-07	8E-13	1E-08	3E-07	9.E-08	2.E-13	3.E-09	9.E-08		3E-07	6E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08
				Excess Cancer Risk		**2.E-04**	**3.E-12**	**9.E-08**	**2.E-04**				**Excess Cancer Risk**		**6.E-07**	**3.E-12**	**3.E-08**	**7.E-07**

Table D-1-4: Radiological Risk Assessments For Industrail Worker - EA F Plus G

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	6E-13	3E-11	6E-12	3E-11	8.E-12	3.E-10	7.E-11	4.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	5E-06	3E-15	3E-09	5E-06	2.E-05	9.E-15	9.E-09	2.E-05	4E-16	2E-25	2E-19	4E-16	1.E-15	7.E-25	7.E-19	1.E-15
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	1E-11	3E-16	4E-10	4E-10	3.E-11	6.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	1E-05	6E-15	2E-09	1E-05	3.E-05	1.E-14	4.E-09	3.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	4E-08	1E-14	7E-09	5E-08	1.E-08	3.E-15	2.E-09	1.E-08	1E-18	3E-25	2E-19	1E-18	4.E-19	1.E-25	7.E-20	4.E-19
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	7E-09	1E-12	1E-08	2E-08	1.E-08	1.E-12	2.E-08	3.E-08	3E-07	1E-12	1E-08	3E-07	4.E-07	2.E-12	2.E-08	4.E-07
U-234	0.3	7E-10	9E-13	1E-08	1E-08	2.E-10	3.E-13	3.E-09	3.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	3.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.24	3E-07	8E-13	1E-08	3E-07	8.E-08	2.E-13	3.E-09	8.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	2.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**4.E-05**	**3.E-10**	**4.E-08**	**4.E-05**			**Excess Cancer Risk**		**5.E-07**	**2.E-12**	**3.E-08**	**5.E-07**

Table D-1-5: Radiological Risk Assessments For Industrail Worker - EA H Plus I

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	6E-13	3E-11	6E-12	3E-11	2.E-12	9.E-11	2.E-11	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-06	3E-15	3E-09	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	4E-16	2E-25	2E-19	4E-16	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	1E-09	6E-13	1E-09	0.E+00	1.E-07	4.E-11	1.E-07	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	1E-11	3E-16	4E-10	4E-10	3.E-11	7.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	1E-05	6E-15	2E-09	1E-05	8.E-05	4.E-14	1.E-08	8.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	4E-08	1E-14	7E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-18	3E-25	2E-19	1E-18	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	3.E-08	3E-07	1E-12	1E-08	3E-07	4.E-07	2.E-12	2.E-08	5.E-07
U-234	0.35	7E-10	9E-13	1E-08	1E-08	3.E-10	3.E-13	3.E-09	4.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	3.E-13	3.E-09	2.E-08
U-235	0.0078	2E-06	8E-13	1E-08	2E-06	1.E-08	7.E-15	8.E-11	1.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	7.E-15	8.E-11	1.E-08
U-238	0.18	3E-07	8E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08	3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	5.E-08
				Excess Cancer Risk		**8.E-05**	**1.E-07**	**4.E-08**	**8.E-05**			**Excess Cancer Risk**		**5.E-07**	**3.E-12**	**3.E-08**	**5.E-07**

Table D-1-6: Radiological Risk Assessments For Industrail Worker - EA J

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	6E-13	3E-11	6E-12	3E-11	9.E-12	3.E-10	8.E-11	4.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	5E-06	3E-15	3E-09	5E-06	3.E-05	2.E-14	2.E-08	3.E-05	4E-16	2E-25	2E-19	4E-16	2.E-15	1.E-24	1.E-18	2.E-15
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-10	2E-12	2E-08	2E-08	1.E-11	1.E-13	1.E-09	1.E-09	1E-11	8E-16	9E-12	2E-11	7.E-13	6.E-17	6.E-13	1.E-12
Pu-239	0.038	6E-10	2E-12	2E-08	2E-08	2.E-11	7.E-14	7.E-10	7.E-10	5E-10	2E-12	2E-08	2E-08	2.E-11	7.E-14	6.E-10	6.E-10
Pu-241	0.14	1E-09	3E-14	3E-10	1E-09	2.E-10	5.E-15	5.E-11	2.E-10	5E-10	8E-15	9E-11	6E-10	7.E-11	1.E-15	1.E-11	9.E-11
Se-79	11.3	1E-11	3E-16	4E-10	4E-10	1.E-10	3.E-15	5.E-09	5.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	4E-08	1E-14	7E-09	5E-08	2.E-07	4.E-14	3.E-08	2.E-07	1E-18	3E-25	2E-19	1E-18	5.E-18	1.E-24	9.E-19	6.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-12	1E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	7E-10	9E-13	1E-08	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	4E-08	8E-13	9E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.22	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**3.E-05**	**3.E-10**	**6.E-08**	**3.E-05**			**Excess Cancer Risk**		**7.E-08**	**2.E-13**	**3.E-09**	**7.E-08**

Table D-1-7: Radiological Risk Assessments For Industrail Worker - EA L1 Plus L2

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)					RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**% Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	6E-13	3E-11	6E-12	3E-11	3.E-11	1.E-09	3.E-10	2.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	5E-06	3E-15	3E-09	5E-06	2.E-05	1.E-14	1.E-08	2.E-05	18%	4E-16	2E-25	2E-19	4E-16	1.E-15	8.E-25	8.E-19	1.E-15
H-3	4.7	0E+00	1E-09	6E-13	1E-09	0.E+00	7.E-09	3.E-12	7.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-16	9E-11	9E-11	0.E+00	7.E-14	3.E-08	3.E-08		0E+00	9E-20	5E-14	5E-14	0.E+00	4.E-17	2.E-11	2.E-11
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	1E-11	3E-16	4E-10	4E-10	2.E-11	4.E-16	6.E-10	7.E-10		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	1E-05	6E-15	2E-09	1E-05	9.E-05	5.E-14	1.E-08	9.E-05	82%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	4E-08	1E-14	7E-09	5E-08	8.E-08	2.E-14	1.E-08	1.E-07		1E-18	3E-25	2E-19	1E-18	2.E-18	7.E-25	4.E-19	3.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	7E-09	1E-12	1E-08	2E-08	1.E-08	1.E-12	2.E-08	3.E-08		3E-07	1E-12	1E-08	3E-07	4.E-07	2.E-12	2.E-08	4.E-07
U-234	0.25	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	2.E-09	3.E-09		4E-08	8E-13	9E-09	5E-08	9.E-09	2.E-13	2.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08		1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.23	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08		3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**1.E-04**	**8.E-09**	**1.E-07**	**1.E-04**				**Excess Cancer Risk**		**5.E-07**	**2.E-12**	**3.E-08**	**5.E-07**

EA P

RPP-RPT-58329, Rev. 3

Table D-1-8: Radiological Risk Assessments For Industrail Worker - EA P

		T=0 Year								% Cont	T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)					RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**
Am-241	2.2	8E-08	1E-12	1E-08	9E-08	2.E-07	3.E-12	3.E-08	2.E-07	0%	2E-08	2E-13	3E-09	2E-08	3.E-08	5.E-13	6.E-09	4.E-08
C-14	0	6E-13	3E-11	6E-12	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	1E-05	1E-15	7E-10	1E-05	9.E-06	8.E-16	6.E-10	9.E-06	4%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	5E-06	3E-15	3E-09	5E-06	2.E-04	9.E-14	9.E-08	2.E-04	91%	4E-16	2E-25	2E-19	4E-16	1.E-14	7.E-24	7.E-18	1.E-14
H-3	308	0E+00	1E-09	6E-13	1E-09	0.E+00	4.E-07	2.E-10	4.E-07	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	2E-08	5E-15	3E-08	5E-08	1.E-08	4.E-15	2.E-08	4.E-08	0%	1E-12	3E-19	2E-12	3E-12	8.E-13	2.E-19	1.E-12	2.E-12
Ni-63	85	0E+00	2E-16	9E-11	9E-11	0.E+00	2.E-14	8.E-09	8.E-09	0%	0E+00	9E-20	5E-14	5E-14	0.E+00	8.E-18	4.E-12	4.E-12
Np-237	1.5	2E-06	1E-12	9E-09	2E-06	3.E-06	1.E-12	1.E-08	3.E-06	2%	2E-06	9E-13	9E-09	2E-06	3.E-06	1.E-12	1.E-08	3.E-06
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0%	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	6E-10	2E-12	2E-08	2E-08	6.E-09	2.E-11	2.E-07	2.E-07	0%	5E-10	2E-12	2E-08	2E-08	6.E-09	2.E-11	2.E-07	2.E-07
Pu-241	39.9	1E-09	3E-14	3E-10	1E-09	4.E-08	1.E-12	1.E-08	6.E-08	0%	5E-10	8E-15	9E-11	6E-10	2.E-08	3.E-13	4.E-09	2.E-08
Se-79	4.6	1E-11	3E-16	4E-10	4E-10	6.E-11	1.E-15	2.E-09	2.E-09	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	4E-08	1E-14	7E-09	5E-08	3.E-06	9.E-13	6.E-07	4.E-06	2%	1E-18	3E-25	2E-19	1E-18	1.E-16	3.E-23	2.E-17	1.E-16
Tc-99	24	9E-11	5E-16	2E-10	3E-10	2.E-09	1.E-14	4.E-09	6.E-09	0%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	3.E-08	0%	3E-07	1E-12	1E-08	3E-07	5.E-07	3.E-12	3.E-08	5.E-07
U-234	0.72	7E-10	9E-13	1E-08	1E-08	5.E-10	7.E-13	7.E-09	8.E-09	0%	4E-08	8E-13	9E-09	5E-08	3.E-08	6.E-13	6.E-09	3.E-08
U-235	0.025	2E-06	8E-13	1E-08	2E-06	4.E-08	2.E-14	3.E-10	4.E-08	0%	1E-06	8E-13	1E-08	1E-06	3.E-08	2.E-14	2.E-10	3.E-08
U-238	0.52	3E-07	8E-13	1E-08	3E-07	2.E-07	4.E-13	6.E-09	2.E-07	0%	3E-07	6E-13	1E-08	3E-07	1.E-07	3.E-13	5.E-09	1.E-07
				Excess Cancer Risk		**2.E-04**	**4.E-07**	**1.E-06**	**2.E-04**				**Excess Cancer Risk**		**4.E-06**	**2.E-11**	**2.E-07**	**4.E-06**

Table D-1-9: Radiological Risk Assessments For Industrail Worker - EA R

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	3E-11	6E-12	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-06	3E-15	3E-09	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	4E-16	2E-25	2E-19	4E-16	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	1E-09	6E-13	1E-09	0.E+00	3.E-09	1.E-12	3.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	9E-09	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	4E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	4E-08	1E-14	7E-09	5E-08	2.E-08	4.E-15	3.E-09	2.E-08	1E-18	3E-25	2E-19	1E-18	5.E-19	1.E-25	8.E-20	5.E-19
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	7E-09	1E-12	1E-08	2E-08	2.E-08	2.E-12	2.E-08	4.E-08	3E-07	1E-12	1E-08	3E-07	7.E-07	3.E-12	3.E-08	7.E-07
U-234	0.22	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	2.E-09	2.E-09	4E-08	8E-13	9E-09	5E-08	8.E-09	2.E-13	2.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.22	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**1.E-07**	**3.E-09**	**3.E-08**	**2.E-07**			**Excess Cancer Risk**		**7.E-07**	**4.E-12**	**4.E-08**	**8.E-07**

Table D-1-10 Radiological Risk Assessments For Industrail Worker - EA U

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	6E-13	3E-11	6E-12	3E-11	1.E-12	4.E-11	1.E-11	5.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	5E-06	3E-15	3E-09	5E-06	1.E-05	6.E-15	6.E-09	1.E-05	4E-16	2E-25	2E-19	4E-16	8.E-16	5.E-25	5.E-19	8.E-16
H-3	0	0E+00	1E-09	6E-13	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	9E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	2E-06	1E-12	9E-09	2E-06	1.E-06	6.E-13	6.E-09	1.E-06	2E-06	9E-13	9E-09	2E-06	1.E-06	6.E-13	5.E-09	1.E-06
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	3E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	9E-11	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	1E-11	3E-16	4E-10	4E-10	4.E-11	8.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	1E-05	6E-15	2E-09	1E-05	6.E-05	4.E-14	1.E-08	6.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	4E-08	1E-14	7E-09	5E-08	2.E-07	5.E-14	3.E-08	2.E-07	1E-18	3E-25	2E-19	1E-18	5.E-18	1.E-24	9.E-19	6.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	4.E-08	3E-07	1E-12	1E-08	3E-07	6.E-07	3.E-12	3.E-08	6.E-07
U-234	0.31	7E-10	9E-13	1E-08	1E-08	2.E-10	3.E-13	3.E-09	3.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	3.E-09	1.E-08
U-235	0.0089	2E-06	8E-13	1E-08	2E-06	1.E-08	8.E-15	9.E-11	1.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	9.E-11	1.E-08
U-238	0.21	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**8.E-05**	**5.E-11**	**8.E-08**	**8.E-05**			**Excess Cancer Risk**		**2.E-06**	**4.E-12**	**4.E-08**	**2.E-06**

Table D-1-11: Maximum Risk Assessment Results for Industrial Worker

Exposure Pathways	Exposure Areas									
	A plus B	**C**	**E**	**F plus G**	**H plus I**	**J**	**L1 plus L2**	**P**	**R**	**U**
External Gamma	5.E-04	6.E-04	2.E-04	4.E-05	8.E-05	3.E-05	1.E-04	2.E-04	7.E-07	8.E-05
Inhalation	9.E-11	6.E-13	3.E-12	3.E-10	1.E-07	3.E-10	8.E-09	4.E-07	4.E-12	5.E-11
Soil Ingestion	3.E-07	1.E-07	9.E-08	4.E-08	4.E-08	6.E-08	1.E-07	1.E-06	4.E-08	8.E-08
Cumulative	**5E-04**	**6E-04**	**2.1E-04**	4E-05	8E-05	3.1E-05	**1.1E-04**	**2E-04**	8E-07	8E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-126	Cs-137; Sn-126	None	None	None	Cs-137; Sn-126	Cs-137	None	None

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR INDUSTRIAL WORKER

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   1
 Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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                       Table of Contents
                       -----------------
    Part III: Intake Quantities and Health Risk Factors
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 Cancer Risk Slope Factors ...............................    2
 Risk Slope and ETFG for the Ground Pathway ..............    6
 Amount of Intake Quantities and Excess Cancer Risks
      Time= 0.000E+00 ....................................    8
      Time= 1.000E+00 ....................................   13
      Time= 3.000E+00 ....................................   18
      Time= 1.000E+01 ....................................   23
      Time= 3.000E+01 ....................................   28
      Time= 1.000E+02 ....................................   33
      Time= 3.000E+02 ....................................   38
      Time= 1.000E+03 ....................................   43
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   2
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 3
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   4
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   5
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                      Current     Base      Parameter
  Menu                          Parameter                             Value      Case*       Name
-----------------------------------------------------------------------------------------------------------
Sf-Rn  Bi-214                                                       1.50E-11   1.50E-11   SLPFRN(1,4)

Sf-Rn  Radon K factors, (mrem/WLM):
Sf-Rn  Rn-222 Indoor                                                7.60E+02   7.60E+02   KFACTR(1,1)
Sf-Rn  Rn-222 Outdoor                                               5.70E+02   5.70E+02   KFACTR(1,2)
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*Base Case means Default.Lib w/o Associate Nuclide contributions.
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   6
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01	1.157E-01
Ac-227	3.480E-10	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01
Am-241	2.760E-08	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01
At-217	1.320E-09	1.129E-01	1.129E-01	1.129E-01	1.129E-01	1.129E-01	1.129E-01	1.129E-01	1.129E-01
At-218	3.570E-09	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01
Ba-137m	2.690E-06	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Bi-210	2.760E-09	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01
Bi-211	1.880E-07	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01
Bi-213	5.650E-07	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Bi-214	7.480E-06	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
C-14	7.830E-12	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01
Co-60	1.240E-05	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01
Cs-137	5.320E-10	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01
Fr-221	1.110E-07	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01
Fr-223	1.400E-07	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
H-3	0.000E+00	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01
I-129	6.100E-09	1.195E-01	1.195E-01	1.195E-01	1.195E-01	1.195E-01	1.195E-01	1.195E-01	1.195E-01
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01
Pa-231	1.390E-07	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01
Pa-233	7.430E-07	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01
Pa-234	8.710E-06	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01
Pa-234m	6.870E-08	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Pb-209	5.370E-10	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01
Pb-210	1.410E-09	1.175E-01	1.175E-01	1.175E-01	1.175E-01	1.175E-01	1.175E-01	1.175E-01	1.175E-01
Pb-211	2.290E-07	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Pb-214	9.820E-07	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01	1.139E-01
Po-210	3.950E-11	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Po-211	3.580E-08	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Po-215	7.480E-10	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Po-218	4.260E-11	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Pu-238	7.220E-11	1.218E-01	1.218E-01	1.218E-01	1.218E-01	1.218E-01	1.218E-01	1.218E-01	1.218E-01
Pu-239	2.000E-10	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01
Pu-241	4.110E-12	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01
Ra-223	4.340E-07	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
Ra-225	5.910E-09	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01	1.173E-01
Ra-226	2.290E-08	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01
Rn-219	2.250E-07	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01
Rn-222	1.740E-09	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01
Sb-126	1.280E-05	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Sb-126m	6.940E-06	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01

Se-79	1.100E-11	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01
Sn-126	9.960E-08	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01
Sr-90	4.820E-10	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01
Tc-99	8.140E-11	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01	1.160E-01
Th-227	3.780E-07	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01
Th-229	2.250E-07	1.158E-01	1.158E-01	1.158E-01	1.158E-01	1.158E-01	1.158E-01	1.158E-01	1.158E-01
Th-230	8.190E-10	1.159E-01	1.159E-01	1.159E-01	1.159E-01	1.159E-01	1.159E-01	1.159E-01	1.159E-01

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page   7
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01
Th-234	1.630E-08	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01	1.162E-01
Tl-207	1.520E-08	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Tl-209	9.830E-06	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01
Tl-210	0.000E+00	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01	1.250E-01
U-233	9.820E-10	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01
U-234	2.520E-10	1.170E-01	1.170E-01	1.170E-01	1.170E-01	1.170E-01	1.170E-01	1.170E-01	1.170E-01
U-235	5.180E-07	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01	1.154E-01
U-237	3.760E-07	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01
U-238	4.990E-11	1.214E-01	1.214E-01	1.214E-01	1.214E-01	1.214E-01	1.214E-01	1.214E-01	1.214E-01
Y-90	1.910E-08	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 8
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
C-14	2.059E+01	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Co-60	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Cs-137	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
H-3	1.729E+03	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
I-129	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Ni-63	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Np-237	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Pu-239	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Pu-241	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Sn-126	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Sr-90	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Tc-99	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
U-234	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
U-235	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
U-238	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 9

Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.424E-10	0.0000	4.178E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.910E-12	0.0000
Am-241	7.985E-08	0.0027	1.271E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.379E-08	0.0005
C-14	6.367E-13	0.0000	2.525E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.741E-12	0.0000
Co-60	1.026E-05	0.3418	1.002E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.753E-10	0.0000
Cs-137	5.415E-06	0.1804	2.881E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-09	0.0001
H-3	0.000E+00	0.0000	1.396E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.657E-13	0.0000
I-129	1.618E-08	0.0005	4.824E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.962E-08	0.0010
Ni-63	0.000E+00	0.0000	1.784E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.972E-11	0.0000
Np-237	2.275E-06	0.0758	9.742E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.424E-09	0.0003
Pa-231	1.044E-10	0.0000	6.815E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.167E-12	0.0000
Pb-210	8.209E-16	0.0000	7.074E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.416E-14	0.0000
Pu-238	1.993E-10	0.0000	1.607E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E-08	0.0005
Pu-239	5.767E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0006
Pu-241	2.239E-11	0.0000	1.709E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-10	0.0000
Ra-226	9.722E-12	0.0000	3.879E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.155E-14	0.0000
Se-79	1.276E-11	0.0000	2.692E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.000E-10	0.0000
Sn-126	9.896E-06	0.3296	5.586E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.619E-09	0.0001
Sr-90	4.151E-08	0.0014	1.103E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.402E-09	0.0002
Tc-99	9.413E-11	0.0000	5.155E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.651E-10	0.0000
Th-229	3.913E-09	0.0001	9.183E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.732E-11	0.0000
Th-230	2.665E-13	0.0000	1.296E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-12	0.0000
U-233	2.830E-09	0.0001	9.580E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-08	0.0003
U-234	7.354E-10	0.0000	9.411E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.864E-09	0.0003
U-235	1.562E-06	0.0520	8.464E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-08	0.0003
U-238	3.216E-07	0.0107	8.000E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-08	0.0004
Total	2.988E-05	0.9952	1.430E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-07	0.0048

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 10
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.463E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.363E-08	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.162E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-05	0.3419
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.418E-06	0.1805
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.396E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-08	0.0015
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.972E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.285E-06	0.0761
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.106E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.498E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-08	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0006
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.597E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.743E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.128E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.897E-06	0.3297
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.892E-08	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.593E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.000E-09	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.651E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.284E-08	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.572E-06	0.0524
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.341E-07	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.002E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 11
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.875E-08	0.0026	1.254E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-08	0.0005
C-14	6.367E-13	0.0000	2.525E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.741E-12	0.0000
Co-60	1.026E-05	0.3418	1.002E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.753E-10	0.0000
Cs-137	5.415E-06	0.1804	2.881E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-09	0.0001
H-3	0.000E+00	0.0000	1.396E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.657E-13	0.0000
I-129	1.618E-08	0.0005	4.824E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.962E-08	0.0010
Ni-63	0.000E+00	0.0000	1.784E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.972E-11	0.0000
Np-237	2.275E-06	0.0758	9.742E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.424E-09	0.0003
Pu-238	1.994E-10	0.0000	1.607E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E-08	0.0005
Pu-239	5.767E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0006
Pu-241	1.126E-09	0.0000	3.465E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.278E-10	0.0000
Se-79	1.276E-11	0.0000	2.692E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.000E-10	0.0000
Sn-126	9.896E-06	0.3296	5.586E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.619E-09	0.0001
Sr-90	4.151E-08	0.0014	1.103E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.402E-09	0.0002
Tc-99	9.413E-11	0.0000	5.155E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.651E-10	0.0000
U-233	6.743E-09	0.0002	9.672E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-08	0.0003
U-234	7.454E-10	0.0000	9.412E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.865E-09	0.0003
U-235	1.562E-06	0.0520	8.475E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-08	0.0003
U-238	3.216E-07	0.0107	8.000E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-08	0.0004
Total	2.988E-05	0.9952	1.430E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-07	0.0048

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 12
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.235E-08	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.162E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-05	0.3419
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.418E-06	0.1805
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.396E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-08	0.0015
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.972E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.285E-06	0.0761
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-08	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0006
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.454E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.128E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.897E-06	0.3297
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.892E-08	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.593E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.684E-08	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.572E-06	0.0524
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.341E-07	0.0111
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.002E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 13
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.523E-13	0.000E+00	0.000E+00	0.000E+00	1.380E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.380E-06
Am-241	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
C-14	4.862E+00	0.000E+00	0.000E+00	0.000E+00	9.785E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.785E-01
Co-60	1.190E-06	0.000E+00	0.000E+00	0.000E+00	3.631E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.631E+00
Cs-137	1.326E-06	0.000E+00	0.000E+00	0.000E+00	4.047E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.047E+00
H-3	6.025E+02	0.000E+00	0.000E+00	0.000E+00	1.443E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.443E+00
I-129	1.345E-06	0.000E+00	0.000E+00	0.000E+00	4.103E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.103E+00
Ni-63	1.348E-06	0.000E+00	0.000E+00	0.000E+00	4.111E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.111E+00
Np-237	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.143E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.143E+00
Pa-231	2.872E-11	0.000E+00	0.000E+00	0.000E+00	8.763E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.763E-05
Pb-210	2.721E-17	0.000E+00	0.000E+00	0.000E+00	8.303E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.303E-11
Pu-238	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.110E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.110E+00
Pu-239	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
Pu-241	1.294E-06	0.000E+00	0.000E+00	0.000E+00	3.948E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.948E+00
Ra-226	2.647E-15	0.000E+00	0.000E+00	0.000E+00	8.076E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.076E-09
Se-79	1.241E-06	0.000E+00	0.000E+00	0.000E+00	3.787E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.787E+00
Sn-126	1.241E-06	0.000E+00	0.000E+00	0.000E+00	3.787E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.787E+00
Sr-90	1.325E-06	0.000E+00	0.000E+00	0.000E+00	4.044E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.044E+00
Tc-99	1.241E-06	0.000E+00	0.000E+00	0.000E+00	3.787E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.787E+00
Th-229	1.282E-10	0.000E+00	0.000E+00	0.000E+00	3.912E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.912E-04
Th-230	1.222E-11	0.000E+00	0.000E+00	0.000E+00	3.729E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.729E-05
U-233	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
U-234	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
U-235	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
U-238	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 14

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Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.706E-10	0.0000	4.665E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.366E-12	0.0000
Am-241	7.979E-08	0.0029	1.270E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.377E-08	0.0005
C-14	1.503E-13	0.0000	5.960E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.355E-12	0.0000
Co-60	8.996E-06	0.3238	8.787E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.920E-10	0.0000
Cs-137	5.290E-06	0.1904	2.814E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.867E-09	0.0001
H-3	0.000E+00	0.0000	4.860E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.970E-13	0.0000
I-129	1.602E-08	0.0006	4.777E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-08	0.0011
Ni-63	0.000E+00	0.0000	1.771E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.905E-11	0.0000
Np-237	2.275E-06	0.0819	9.741E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.424E-09	0.0003
Pa-231	1.127E-10	0.0000	7.359E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.659E-12	0.0000
Pb-210	9.547E-16	0.0000	8.228E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.811E-14	0.0000
Pu-238	1.978E-10	0.0000	1.594E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-08	0.0006
Pu-239	5.766E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0006
Pu-241	2.134E-11	0.0000	1.628E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-10	0.0000
Ra-226	1.093E-11	0.0000	4.362E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.423E-14	0.0000
Se-79	1.166E-11	0.0000	2.461E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.657E-10	0.0000
Sn-126	9.047E-06	0.3257	5.107E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-09	0.0001
Sr-90	4.052E-08	0.0015	1.077E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.225E-09	0.0003
Tc-99	8.606E-11	0.0000	4.713E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.510E-10	0.0000
Th-229	4.226E-09	0.0002	9.917E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.429E-11	0.0000
Th-230	2.878E-13	0.0000	1.400E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-12	0.0000
U-233	2.830E-09	0.0001	9.578E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.001E-08	0.0004
U-234	7.353E-10	0.0000	9.409E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.862E-09	0.0004
U-235	1.561E-06	0.0562	8.462E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0004
U-238	3.216E-07	0.0116	7.998E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E-08	0.0004
Total	2.764E-05	0.9949	5.013E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.417E-07	0.0051

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  15
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.750E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.356E-08	0.0034
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.466E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.996E-06	0.3239
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.293E-06	0.1905
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.862E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.536E-08	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.905E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0822
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.194E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.906E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.522E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.774E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.048E-06	0.3257
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.370E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.320E-09	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.284E-08	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.060E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-06	0.0566
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.340E-07	0.0120
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.778E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  16
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.862E-08	0.0028	1.251E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-08	0.0005
C-14	1.503E-13	0.0000	5.960E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.355E-12	0.0000
Co-60	8.996E-06	0.3238	8.787E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.920E-10	0.0000
Cs-137	5.290E-06	0.1904	2.814E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.867E-09	0.0001
H-3	0.000E+00	0.0000	4.860E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.970E-13	0.0000
I-129	1.602E-08	0.0006	4.777E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-08	0.0011
Ni-63	0.000E+00	0.0000	1.771E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.905E-11	0.0000
Np-237	2.275E-06	0.0819	9.742E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.424E-09	0.0003
Pu-238	1.978E-10	0.0000	1.594E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-08	0.0006
Pu-239	5.767E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0006
Pu-241	1.196E-09	0.0000	3.499E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.336E-10	0.0000
Se-79	1.166E-11	0.0000	2.461E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.657E-10	0.0000
Sn-126	9.047E-06	0.3257	5.107E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-09	0.0001
Sr-90	4.052E-08	0.0015	1.077E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.225E-09	0.0003
Tc-99	8.606E-11	0.0000	4.713E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.510E-10	0.0000
U-233	7.055E-09	0.0003	9.677E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-08	0.0004
U-234	7.464E-10	0.0000	9.410E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.863E-09	0.0004
U-235	1.562E-06	0.0562	8.474E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-08	0.0004
U-238	3.216E-07	0.0116	7.998E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-08	0.0004
Total	2.764E-05	0.9949	5.013E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.417E-07	0.0051

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 17
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.220E-08	0.0033
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.466E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.996E-06	0.3239
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.293E-06	0.1905
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.862E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.536E-08	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.905E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0822
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.530E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.774E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.048E-06	0.3257
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.370E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.716E-08	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.572E-06	0.0566
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.340E-07	0.0120
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.778E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 18
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.984E-12	0.000E+00	0.000E+00	0.000E+00	1.215E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.215E-05
Am-241	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.141E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.141E+00
C-14	2.708E-01	0.000E+00	0.000E+00	0.000E+00	5.449E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.449E-02
Co-60	9.146E-07	0.000E+00	0.000E+00	0.000E+00	2.790E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.790E+00
Cs-137	1.266E-06	0.000E+00	0.000E+00	0.000E+00	3.863E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.863E+00
H-3	7.305E+01	0.000E+00	0.000E+00	0.000E+00	1.750E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.750E-01
I-129	1.319E-06	0.000E+00	0.000E+00	0.000E+00	4.024E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.024E+00
Ni-63	1.327E-06	0.000E+00	0.000E+00	0.000E+00	4.050E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.050E+00
Np-237	1.358E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
Pa-231	8.613E-11	0.000E+00	0.000E+00	0.000E+00	2.628E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.628E-04
Pb-210	7.232E-16	0.000E+00	0.000E+00	0.000E+00	2.207E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.207E-09
Pu-238	1.326E-06	0.000E+00	0.000E+00	0.000E+00	4.045E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.045E+00
Pu-239	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.142E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E+00
Pu-241	1.175E-06	0.000E+00	0.000E+00	0.000E+00	3.585E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.585E+00
Ra-226	2.381E-14	0.000E+00	0.000E+00	0.000E+00	7.264E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.264E-08
Se-79	1.037E-06	0.000E+00	0.000E+00	0.000E+00	3.165E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.165E+00
Sn-126	1.037E-06	0.000E+00	0.000E+00	0.000E+00	3.165E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.165E+00
Sr-90	1.263E-06	0.000E+00	0.000E+00	0.000E+00	3.852E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.852E+00
Tc-99	1.037E-06	0.000E+00	0.000E+00	0.000E+00	3.165E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.165E+00
Th-229	3.845E-10	0.000E+00	0.000E+00	0.000E+00	1.173E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.173E-03
Th-230	3.666E-11	0.000E+00	0.000E+00	0.000E+00	1.118E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.118E-04
U-233	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.140E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.140E+00
U-234	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.140E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.140E+00
U-235	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.140E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.140E+00
U-238	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.140E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.140E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent
RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 19

Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.327E-10	0.0000	5.734E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.367E-12	0.0000
Am-241	7.966E-08	0.0033	1.268E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.375E-08	0.0006
C-14	8.362E-15	0.0000	3.316E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.541E-14	0.0000
Co-60	6.912E-06	0.2885	6.752E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-10	0.0000
Cs-137	5.049E-06	0.2107	2.686E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.737E-09	0.0001
H-3	0.000E+00	0.0000	5.888E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.387E-14	0.0000
I-129	1.572E-08	0.0007	4.685E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-08	0.0012
Ni-63	0.000E+00	0.0000	1.744E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.771E-11	0.0000
Np-237	2.275E-06	0.0949	9.741E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.423E-09	0.0004
Pa-231	1.294E-10	0.0000	8.447E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.643E-12	0.0000
Pb-210	1.269E-15	0.0000	1.094E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.736E-14	0.0000
Pu-238	1.946E-10	0.0000	1.569E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-08	0.0006
Pu-239	5.765E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0008
Pu-241	1.938E-11	0.0000	1.479E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.188E-10	0.0000
Ra-226	1.363E-11	0.0000	5.439E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.022E-14	0.0000
Se-79	9.747E-12	0.0000	2.057E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-10	0.0000
Sn-126	7.561E-06	0.3155	4.268E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.237E-09	0.0001
Sr-90	3.860E-08	0.0016	1.026E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.883E-09	0.0003
Tc-99	7.193E-11	0.0000	3.939E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.262E-10	0.0000
Th-229	4.850E-09	0.0002	1.138E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.082E-10	0.0000
Th-230	3.304E-13	0.0000	1.607E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.716E-12	0.0000
U-233	2.828E-09	0.0001	9.574E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-08	0.0004
U-234	7.350E-10	0.0000	9.405E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.858E-09	0.0004
U-235	1.561E-06	0.0651	8.458E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0004
U-238	3.214E-07	0.0134	7.995E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E-08	0.0005
Total	2.382E-05	0.9942	6.849E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-07	0.0058

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  20
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.381E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.341E-08	0.0039
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.154E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.913E-06	0.2885
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.052E-06	0.2108
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.890E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.449E-08	0.0019
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.771E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0953
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.370E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.863E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.569E-08	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0008
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.154E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.562E-06	0.3156
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-08	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.959E-09	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.047E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-08	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-06	0.0655
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.339E-07	0.0139
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.396E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 21
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.836E-08	0.0033	1.247E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.353E-08	0.0006
C-14	8.362E-15	0.0000	3.316E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.541E-14	0.0000
Co-60	6.912E-06	0.2885	6.752E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-10	0.0000
Cs-137	5.049E-06	0.2107	2.686E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.737E-09	0.0001
H-3	0.000E+00	0.0000	5.888E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.387E-14	0.0000
I-129	1.572E-08	0.0007	4.685E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-08	0.0012
Ni-63	0.000E+00	0.0000	1.744E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.771E-11	0.0000
Np-237	2.275E-06	0.0949	9.741E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.423E-09	0.0004
Pu-238	1.947E-10	0.0000	1.569E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-08	0.0006
Pu-239	5.766E-10	0.0000	1.868E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-08	0.0008
Pu-241	1.326E-09	0.0001	3.559E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.444E-10	0.0000
Se-79	9.747E-12	0.0000	2.057E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-10	0.0000
Sn-126	7.561E-06	0.3155	4.268E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.237E-09	0.0001
Sr-90	3.860E-08	0.0016	1.026E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.883E-09	0.0003
Tc-99	7.193E-11	0.0000	3.939E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.262E-10	0.0000
U-233	7.678E-09	0.0003	9.687E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.011E-08	0.0004
U-234	7.489E-10	0.0000	9.406E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.859E-09	0.0004
U-235	1.561E-06	0.0651	8.472E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.009E-08	0.0004
U-238	3.214E-07	0.0134	7.995E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.245E-08	0.0005
Total	2.382E-05	0.9942	6.849E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-07	0.0058

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 22
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.189E-08	0.0038
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.154E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.913E-06	0.2885
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.052E-06	0.2108
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.890E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.449E-08	0.0019
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.771E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.0953
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.570E-08	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-08	0.0008
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.671E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.154E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.562E-06	0.3156
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.549E-08	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.779E-08	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-06	0.0656
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.339E-07	0.0139
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.396E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 23
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.111E-11	0.000E+00	0.000E+00	0.000E+00	1.254E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.254E-04
Am-241	1.353E-06	0.000E+00	0.000E+00	0.000E+00	4.127E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.127E+00
C-14	1.081E-05	0.000E+00	0.000E+00	0.000E+00	2.176E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.176E-06
Co-60	3.637E-07	0.000E+00	0.000E+00	0.000E+00	1.110E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.110E+00
Cs-137	1.075E-06	0.000E+00	0.000E+00	0.000E+00	3.281E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.281E+00
H-3	4.476E-02	0.000E+00	0.000E+00	0.000E+00	1.072E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.072E-04
I-129	1.232E-06	0.000E+00	0.000E+00	0.000E+00	3.760E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.760E+00
Ni-63	1.259E-06	0.000E+00	0.000E+00	0.000E+00	3.840E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.840E+00
Np-237	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.141E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.141E+00
Pa-231	2.866E-10	0.000E+00	0.000E+00	0.000E+00	8.745E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.745E-04
Pb-210	2.537E-14	0.000E+00	0.000E+00	0.000E+00	7.740E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.740E-08
Pu-238	1.254E-06	0.000E+00	0.000E+00	0.000E+00	3.826E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.826E+00
Pu-239	1.357E-06	0.000E+00	0.000E+00	0.000E+00	4.139E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.139E+00
Pu-241	8.386E-07	0.000E+00	0.000E+00	0.000E+00	2.559E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.559E+00
Ra-226	2.640E-13	0.000E+00	0.000E+00	0.000E+00	8.056E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.056E-07
Se-79	5.537E-07	0.000E+00	0.000E+00	0.000E+00	1.689E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.689E+00
Sn-126	5.537E-07	0.000E+00	0.000E+00	0.000E+00	1.689E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.689E+00
Sr-90	1.066E-06	0.000E+00	0.000E+00	0.000E+00	3.251E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.251E+00
Tc-99	5.538E-07	0.000E+00	0.000E+00	0.000E+00	1.690E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.690E+00
Th-229	1.280E-09	0.000E+00	0.000E+00	0.000E+00	3.906E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.906E-03
Th-230	1.221E-10	0.000E+00	0.000E+00	0.000E+00	3.725E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.725E-04
U-233	1.355E-06	0.000E+00	0.000E+00	0.000E+00	4.134E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.134E+00
U-234	1.355E-06	0.000E+00	0.000E+00	0.000E+00	4.134E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.134E+00
U-235	1.355E-06	0.000E+00	0.000E+00	0.000E+00	4.134E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.134E+00
U-238	1.355E-06	0.000E+00	0.000E+00	0.000E+00	4.134E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.134E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent
RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 24

Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.019E-10	0.0000	1.037E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.710E-12	0.0000
Am-241	7.912E-08	0.0051	1.260E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-08	0.0009
C-14	3.332E-19	0.0000	1.321E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-18	0.0000
Co-60	2.749E-06	0.1774	2.685E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.809E-10	0.0000
Cs-137	4.288E-06	0.2767	2.282E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.325E-09	0.0001
H-3	0.000E+00	0.0000	3.599E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-17	0.0000
I-129	1.469E-08	0.0009	4.378E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.688E-08	0.0017
Ni-63	0.000E+00	0.0000	1.654E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.317E-11	0.0000
Np-237	2.274E-06	0.1467	9.738E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.420E-09	0.0006
Pa-231	1.876E-10	0.0000	1.224E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.108E-11	0.0000
Pb-210	2.956E-15	0.0000	2.548E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.702E-14	0.0000
Pu-238	1.841E-10	0.0000	1.484E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.466E-08	0.0009
Pu-239	5.762E-10	0.0000	1.867E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.799E-08	0.0012
Pu-241	1.383E-11	0.0000	1.055E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.477E-11	0.0000
Ra-226	2.600E-11	0.0000	1.037E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.762E-14	0.0000
Se-79	5.202E-12	0.0000	1.098E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.631E-10	0.0000
Sn-126	4.036E-06	0.2604	2.278E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.603E-10	0.0000
Sr-90	3.258E-08	0.0021	8.659E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.809E-09	0.0004
Tc-99	3.839E-11	0.0000	2.102E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.735E-11	0.0000
Th-229	7.034E-09	0.0005	1.651E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.570E-10	0.0000
Th-230	4.793E-13	0.0000	2.331E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.489E-12	0.0000
U-233	2.824E-09	0.0002	9.560E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.987E-09	0.0006
U-234	7.338E-10	0.0000	9.391E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.843E-09	0.0006
U-235	1.558E-06	0.1005	8.445E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.006E-08	0.0006
U-238	3.209E-07	0.0207	7.982E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.243E-08	0.0008
Total	1.537E-05	0.9913	9.206E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-07	0.0087

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  25
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.116E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.279E-08	0.0060
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-17	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.749E-06	0.1774
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.291E-06	0.2768
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.601E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.157E-08	0.0027
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.317E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.1473
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.986E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.997E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.484E-08	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-08	0.0012
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.861E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.606E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-06	0.2604
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.839E-08	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.057E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.191E-09	0.0005
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.969E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-08	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.058E-08	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.568E-06	0.1012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.334E-07	0.0215
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  26
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.747E-08	0.0050	1.233E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-08	0.0009
C-14	3.332E-19	0.0000	1.321E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-18	0.0000
Co-60	2.749E-06	0.1774	2.685E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.809E-10	0.0000
Cs-137	4.288E-06	0.2767	2.282E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.325E-09	0.0001
H-3	0.000E+00	0.0000	3.599E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-17	0.0000
I-129	1.469E-08	0.0009	4.378E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.688E-08	0.0017
Ni-63	0.000E+00	0.0000	1.654E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.317E-11	0.0000
Np-237	2.274E-06	0.1467	9.739E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.421E-09	0.0006
Pu-238	1.841E-10	0.0000	1.484E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.466E-08	0.0009
Pu-239	5.762E-10	0.0000	1.867E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.799E-08	0.0012
Pu-241	1.689E-09	0.0001	3.721E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E-10	0.0000
Se-79	5.202E-12	0.0000	1.098E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.631E-10	0.0000
Sn-126	4.036E-06	0.2604	2.278E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.603E-10	0.0000
Sr-90	3.258E-08	0.0021	8.659E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.809E-09	0.0004
Tc-99	3.839E-11	0.0000	2.102E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.735E-11	0.0000
U-233	9.858E-09	0.0006	9.724E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.014E-08	0.0007
U-234	7.602E-10	0.0000	9.393E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.845E-09	0.0006
U-235	1.559E-06	0.1006	8.468E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-08	0.0007
U-238	3.209E-07	0.0207	7.983E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.243E-08	0.0008
Total	1.537E-05	0.9913	9.206E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-07	0.0087

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 27
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.084E-08	0.0059
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-17	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.749E-06	0.1774
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.291E-06	0.2768
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.601E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.157E-08	0.0027
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.317E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-06	0.1473
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.485E-08	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-08	0.0012
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.063E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.683E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-06	0.2604
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.839E-08	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.057E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.000E-08	0.0013
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-08	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.569E-06	0.1012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.334E-07	0.0215
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  28
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.038E-10	0.000E+00	0.000E+00	0.000E+00	9.269E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.269E-04
Am-241	1.325E-06	0.000E+00	0.000E+00	0.000E+00	4.044E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.044E+00
C-14	2.468E-18	0.000E+00	0.000E+00	0.000E+00	4.967E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.967E-19
Co-60	2.610E-08	0.000E+00	0.000E+00	0.000E+00	7.964E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.964E-02
Cs-137	6.745E-07	0.000E+00	0.000E+00	0.000E+00	2.058E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.058E+00
H-3	2.662E-11	0.000E+00	0.000E+00	0.000E+00	6.376E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.376E-14
I-129	1.015E-06	0.000E+00	0.000E+00	0.000E+00	3.098E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.098E+00
Ni-63	1.082E-06	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Np-237	1.356E-06	0.000E+00	0.000E+00	0.000E+00	4.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.138E+00
Pa-231	8.560E-10	0.000E+00	0.000E+00	0.000E+00	2.612E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.612E-03
Pb-210	5.916E-13	0.000E+00	0.000E+00	0.000E+00	1.805E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.805E-06
Pu-238	1.070E-06	0.000E+00	0.000E+00	0.000E+00	3.263E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.263E+00
Pu-239	1.354E-06	0.000E+00	0.000E+00	0.000E+00	4.132E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.132E+00
Pu-241	3.199E-07	0.000E+00	0.000E+00	0.000E+00	9.760E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.760E-01
Ra-226	2.364E-12	0.000E+00	0.000E+00	0.000E+00	7.211E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.211E-06
Se-79	9.208E-08	0.000E+00	0.000E+00	0.000E+00	2.810E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.810E-01
Sn-126	9.209E-08	0.000E+00	0.000E+00	0.000E+00	2.810E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.810E-01
Sr-90	6.563E-07	0.000E+00	0.000E+00	0.000E+00	2.002E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.002E+00
Tc-99	9.210E-08	0.000E+00	0.000E+00	0.000E+00	2.810E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.810E-01
Th-229	3.829E-09	0.000E+00	0.000E+00	0.000E+00	1.168E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.168E-02
Th-230	3.655E-10	0.000E+00	0.000E+00	0.000E+00	1.115E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.115E-03
U-233	1.349E-06	0.000E+00	0.000E+00	0.000E+00	4.116E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.116E+00
U-234	1.349E-06	0.000E+00	0.000E+00	0.000E+00	4.116E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.116E+00
U-235	1.349E-06	0.000E+00	0.000E+00	0.000E+00	4.116E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.116E+00
U-238	1.349E-06	0.000E+00	0.000E+00	0.000E+00	4.116E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.116E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  29
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.699E-09	0.0002	2.929E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.741E-11	0.0000
Am-241	7.713E-08	0.0097	1.228E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-08	0.0017
C-14	0.000E+00	0.0000	2.306E-30	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.973E-07	0.0248	1.927E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-11	0.0000
Cs-137	2.690E-06	0.3382	1.431E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.458E-09	0.0002
H-3	0.000E+00	0.0000	2.124E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.608E-27	0.0000
I-129	1.210E-08	0.0015	3.607E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.215E-08	0.0028
Ni-63	0.000E+00	0.0000	1.421E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.147E-11	0.0000
Np-237	2.272E-06	0.2857	9.730E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.412E-09	0.0012
Pa-231	3.528E-10	0.0000	2.303E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.084E-11	0.0000
Pb-210	1.466E-14	0.0000	1.263E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.315E-13	0.0000
Pu-238	1.570E-10	0.0000	1.266E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-08	0.0016
Pu-239	5.752E-10	0.0001	1.864E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.796E-08	0.0023
Pu-241	5.275E-12	0.0000	4.025E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.234E-11	0.0000
Ra-226	8.611E-11	0.0000	3.435E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.909E-13	0.0000
Se-79	8.652E-13	0.0000	1.826E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.713E-11	0.0000
Sn-126	6.712E-07	0.0844	3.789E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-10	0.0000
Sr-90	2.006E-08	0.0025	5.333E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.578E-09	0.0004
Tc-99	6.385E-12	0.0000	3.497E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-11	0.0000
Th-229	1.325E-08	0.0017	3.109E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.956E-10	0.0000
Th-230	9.035E-13	0.0000	4.394E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.692E-12	0.0000
U-233	2.812E-09	0.0004	9.518E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.944E-09	0.0013
U-234	7.307E-10	0.0001	9.351E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.801E-09	0.0012
U-235	1.551E-06	0.1951	8.409E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.002E-08	0.0013
U-238	3.196E-07	0.0402	7.948E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-08	0.0016
Total	7.831E-06	0.9845	8.905E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-07	0.0155

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 30
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.727E-09	0.0002
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.044E-08	0.0114
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-30	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-07	0.0248
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-06	0.3384
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.125E-23	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.425E-08	0.0043
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.147E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-06	0.2869
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.736E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.462E-13	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-08	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.853E-08	0.0023
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.762E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.630E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.799E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.713E-07	0.0844
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.364E-08	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-08	0.0017
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.596E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.276E-08	0.0016
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-08	0.0013
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-06	0.1963
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.319E-07	0.0417
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.954E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  31
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.495E-08	0.0094	1.193E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.293E-08	0.0016
C-14	0.000E+00	0.0000	2.306E-30	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.973E-07	0.0248	1.927E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-11	0.0000
Cs-137	2.690E-06	0.3382	1.431E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.458E-09	0.0002
H-3	0.000E+00	0.0000	2.124E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.608E-27	0.0000
I-129	1.210E-08	0.0015	3.607E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.215E-08	0.0028
Ni-63	0.000E+00	0.0000	1.421E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.147E-11	0.0000
Np-237	2.272E-06	0.2857	9.731E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.414E-09	0.0012
Pu-238	1.571E-10	0.0000	1.266E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-08	0.0016
Pu-239	5.753E-10	0.0001	1.864E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.796E-08	0.0023
Pu-241	2.209E-09	0.0003	3.909E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.126E-10	0.0001
Se-79	8.652E-13	0.0000	1.826E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.713E-11	0.0000
Sn-126	6.712E-07	0.0844	3.789E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-10	0.0000
Sr-90	2.006E-08	0.0025	5.333E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.578E-09	0.0004
Tc-99	6.385E-12	0.0000	3.497E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.120E-11	0.0000
U-233	1.606E-08	0.0020	9.827E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.024E-08	0.0013
U-234	8.176E-10	0.0001	9.353E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.804E-09	0.0012
U-235	1.554E-06	0.1953	8.461E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.007E-08	0.0013
U-238	3.196E-07	0.0402	7.949E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-08	0.0016
Total	7.831E-06	0.9845	8.905E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-07	0.0155

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 32
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.789E-08	0.0110
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-30	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-07	0.0248
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-06	0.3384
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.125E-23	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.425E-08	0.0043
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.147E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-06	0.2869
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-08	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.853E-08	0.0023
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-09	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.799E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.713E-07	0.0844
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.364E-08	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.759E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.630E-08	0.0033
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.062E-08	0.0013
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.564E-06	0.1966
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.319E-07	0.0417
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.954E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 33
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.951E-09	0.000E+00	0.000E+00	0.000E+00	5.952E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.952E-03
Am-241	1.190E-06	0.000E+00	0.000E+00	0.000E+00	3.630E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.630E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	2.584E-12	0.000E+00	0.000E+00	0.000E+00	7.885E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.885E-06
Cs-137	1.318E-07	0.000E+00	0.000E+00	0.000E+00	4.022E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.022E-01
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	5.154E-07	0.000E+00	0.000E+00	0.000E+00	1.573E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.573E+00
Ni-63	6.362E-07	0.000E+00	0.000E+00	0.000E+00	1.941E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.941E+00
Np-237	1.352E-06	0.000E+00	0.000E+00	0.000E+00	4.125E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.125E+00
Pa-231	2.808E-09	0.000E+00	0.000E+00	0.000E+00	8.568E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.568E-03
Pb-210	1.432E-11	0.000E+00	0.000E+00	0.000E+00	4.370E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.370E-05
Pu-238	6.129E-07	0.000E+00	0.000E+00	0.000E+00	1.870E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.870E+00
Pu-239	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.108E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.108E+00
Pu-241	1.096E-08	0.000E+00	0.000E+00	0.000E+00	3.345E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.345E-02
Ra-226	2.577E-11	0.000E+00	0.000E+00	0.000E+00	7.863E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.863E-05
Se-79	1.727E-10	0.000E+00	0.000E+00	0.000E+00	5.270E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.270E-04
Sn-126	1.728E-10	0.000E+00	0.000E+00	0.000E+00	5.272E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.272E-04
Sr-90	1.203E-07	0.000E+00	0.000E+00	0.000E+00	3.671E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.671E-01
Tc-99	1.728E-10	0.000E+00	0.000E+00	0.000E+00	5.274E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.274E-04
Th-229	1.262E-08	0.000E+00	0.000E+00	0.000E+00	3.852E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.852E-02
Th-230	1.209E-09	0.000E+00	0.000E+00	0.000E+00	3.688E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.688E-03
U-233	1.329E-06	0.000E+00	0.000E+00	0.000E+00	4.054E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.054E+00
U-234	1.329E-06	0.000E+00	0.000E+00	0.000E+00	4.055E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.055E+00
U-235	1.329E-06	0.000E+00	0.000E+00	0.000E+00	4.054E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.054E+00
U-238	1.329E-06	0.000E+00	0.000E+00	0.000E+00	4.054E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.054E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 34
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.041E-09	0.0014	1.214E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E-10	0.0000
Am-241	6.900E-08	0.0142	1.098E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-08	0.0024
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.954E-11	0.0000	1.908E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.286E-15	0.0000
Cs-137	5.257E-07	0.1081	2.797E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.850E-10	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.142E-09	0.0013	1.831E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-08	0.0023
Ni-63	0.000E+00	0.0000	8.360E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-11	0.0000
Np-237	2.266E-06	0.4659	9.701E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.384E-09	0.0019
Pa-231	9.192E-10	0.0002	6.001E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.430E-11	0.0000
Pb-210	1.717E-13	0.0000	1.480E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.055E-12	0.0000
Pu-238	8.998E-11	0.0000	7.253E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.165E-09	0.0015
Pu-239	5.719E-10	0.0001	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.785E-08	0.0037
Pu-241	1.808E-13	0.0000	1.380E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.108E-12	0.0000
Ra-226	5.781E-10	0.0001	2.306E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-12	0.0000
Se-79	1.623E-15	0.0000	3.425E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.088E-14	0.0000
Sn-126	1.259E-09	0.0003	7.108E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.060E-13	0.0000
Sr-90	3.678E-09	0.0008	9.777E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.559E-10	0.0001
Tc-99	1.198E-14	0.0000	6.563E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.102E-14	0.0000
Th-229	3.469E-08	0.0071	8.142E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.742E-10	0.0002
Th-230	2.373E-12	0.0000	1.154E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.232E-11	0.0000
U-233	2.770E-09	0.0006	9.375E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.794E-09	0.0020
U-234	7.198E-10	0.0001	9.211E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.655E-09	0.0020
U-235	1.528E-06	0.3143	8.282E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.869E-09	0.0020
U-238	3.147E-07	0.0647	7.828E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.219E-08	0.0025
Total	4.762E-06	0.9792	8.221E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-07	0.0208

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  35
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.155E-09	0.0015
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.091E-08	0.0166
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.260E-07	0.1082
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.739E-08	0.0036
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-06	0.4678
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.735E-10	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.227E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.255E-09	0.0015
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.843E-08	0.0038
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.794E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.251E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-09	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.334E-09	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.300E-14	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.547E-08	0.0073
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.256E-08	0.0026
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.038E-08	0.0021
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.538E-06	0.3163
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-07	0.0672
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.863E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 36
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	6.679E-08	0.0137	1.062E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0024
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.954E-11	0.0000	1.908E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.286E-15	0.0000
Cs-137	5.257E-07	0.1081	2.797E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.850E-10	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.142E-09	0.0013	1.831E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-08	0.0023
Ni-63	0.000E+00	0.0000	8.360E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-11	0.0000
Np-237	2.266E-06	0.4659	9.705E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.389E-09	0.0019
Pu-238	9.018E-11	0.0000	7.255E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.167E-09	0.0015
Pu-239	5.721E-10	0.0001	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.785E-08	0.0037
Pu-241	2.289E-09	0.0005	3.654E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.958E-10	0.0001
Se-79	1.623E-15	0.0000	3.425E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.088E-14	0.0000
Sn-126	1.259E-09	0.0003	7.108E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.060E-13	0.0000
Sr-90	3.678E-09	0.0008	9.777E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.559E-10	0.0001
Tc-99	1.198E-14	0.0000	6.563E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.102E-14	0.0000
U-233	3.745E-08	0.0077	1.018E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.056E-08	0.0022
U-234	1.300E-09	0.0003	9.218E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.668E-09	0.0020
U-235	1.536E-06	0.3159	8.464E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-08	0.0021
U-238	3.147E-07	0.0647	7.831E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.219E-08	0.0025
Total	4.762E-06	0.9792	8.221E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-07	0.0208

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 37
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.831E-08	0.0161
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.260E-07	0.1082
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.739E-08	0.0036
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.275E-06	0.4678
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.258E-09	0.0015
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.843E-08	0.0038
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.684E-09	0.0006
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.251E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-09	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.334E-09	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.300E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.802E-08	0.0099
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-08	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.546E-06	0.3180
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.269E-07	0.0672
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.863E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  38
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.146E-09	0.000E+00	0.000E+00	0.000E+00	2.180E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E-02
Am-241	8.541E-07	0.000E+00	0.000E+00	0.000E+00	2.606E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.606E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	9.363E-24	0.000E+00	0.000E+00	0.000E+00	2.857E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.857E-17
Cs-137	1.243E-09	0.000E+00	0.000E+00	0.000E+00	3.791E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.791E-03
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	7.428E-08	0.000E+00	0.000E+00	0.000E+00	2.266E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.266E-01
Ni-63	1.397E-07	0.000E+00	0.000E+00	0.000E+00	4.262E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.262E-01
Np-237	1.341E-06	0.000E+00	0.000E+00	0.000E+00	4.091E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.091E+00
Pa-231	8.051E-09	0.000E+00	0.000E+00	0.000E+00	2.456E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.456E-02
Pb-210	1.785E-10	0.000E+00	0.000E+00	0.000E+00	5.445E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.445E-04
Pu-238	1.249E-07	0.000E+00	0.000E+00	0.000E+00	3.810E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.810E-01
Pu-239	1.324E-06	0.000E+00	0.000E+00	0.000E+00	4.041E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.041E+00
Pu-241	7.150E-13	0.000E+00	0.000E+00	0.000E+00	2.182E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.182E-06
Ra-226	2.198E-10	0.000E+00	0.000E+00	0.000E+00	6.707E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.707E-04
Se-79	2.795E-18	0.000E+00	0.000E+00	0.000E+00	8.526E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.526E-12
Sn-126	2.798E-18	0.000E+00	0.000E+00	0.000E+00	8.536E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.536E-12
Sr-90	9.446E-10	0.000E+00	0.000E+00	0.000E+00	2.882E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.882E-03
Tc-99	2.801E-18	0.000E+00	0.000E+00	0.000E+00	8.545E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.545E-12
Th-229	3.671E-08	0.000E+00	0.000E+00	0.000E+00	1.120E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.120E-01
Th-230	3.546E-09	0.000E+00	0.000E+00	0.000E+00	1.082E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.082E-02
U-233	1.272E-06	0.000E+00	0.000E+00	0.000E+00	3.882E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.882E+00
U-234	1.273E-06	0.000E+00	0.000E+00	0.000E+00	3.883E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.883E+00
U-235	1.272E-06	0.000E+00	0.000E+00	0.000E+00	3.882E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.882E+00
U-238	1.272E-06	0.000E+00	0.000E+00	0.000E+00	3.882E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.882E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 39
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.302E-08	0.0054	3.968E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.714E-10	0.0001
Am-241	4.954E-08	0.0116	7.886E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.552E-09	0.0020
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	7.078E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.658E-27	0.0000
Cs-137	4.955E-09	0.0012	2.636E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.686E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.851E-10	0.0002	2.639E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.620E-09	0.0004
Ni-63	0.000E+00	0.0000	1.836E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-12	0.0000
Np-237	2.247E-06	0.5255	9.619E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.305E-09	0.0022
Pa-231	2.440E-09	0.0006	1.593E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.442E-10	0.0000
Pb-210	1.737E-12	0.0000	1.497E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.114E-11	0.0000
Pu-238	1.833E-11	0.0000	1.478E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.460E-09	0.0003
Pu-239	5.625E-10	0.0001	1.822E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.756E-08	0.0041
Pu-241	1.179E-17	0.0000	8.997E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.228E-17	0.0000
Ra-226	4.213E-09	0.0010	1.681E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.339E-12	0.0000
Se-79	2.626E-23	0.0000	5.542E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.233E-22	0.0000
Sn-126	2.039E-17	0.0000	1.151E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.336E-21	0.0000
Sr-90	2.888E-11	0.0000	7.676E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.150E-12	0.0000
Tc-99	1.942E-22	0.0000	1.063E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.406E-22	0.0000
Th-229	9.343E-08	0.0219	2.193E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.085E-09	0.0005
Th-230	6.447E-12	0.0000	3.135E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.348E-11	0.0000
U-233	2.652E-09	0.0006	8.978E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.379E-09	0.0022
U-234	6.894E-10	0.0002	8.822E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.246E-09	0.0022
U-235	1.463E-06	0.3423	7.931E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.450E-09	0.0022
U-238	3.014E-07	0.0705	7.496E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-08	0.0027
Total	4.194E-06	0.9811	7.322E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.096E-08	0.0189

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  40
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.339E-08	0.0055
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.809E-08	0.0136
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.078E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.958E-09	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.505E-09	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-06	0.5277
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.584E-09	0.0006
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.288E-11	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.478E-09	0.0003
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-08	0.0042
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.408E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.223E-09	0.0010
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-17	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.403E-11	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.348E-22	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.551E-08	0.0223
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.993E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.203E-08	0.0028
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.937E-09	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.473E-06	0.3445
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-07	0.0732
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.275E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  41
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	4.806E-08	0.0112	7.624E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.268E-09	0.0019
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	7.078E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.658E-27	0.0000
Cs-137	4.955E-09	0.0012	2.636E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.686E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.851E-10	0.0002	2.639E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.620E-09	0.0004
Ni-63	0.000E+00	0.0000	1.836E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-12	0.0000
Np-237	2.246E-06	0.5255	9.633E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.319E-09	0.0022
Pu-238	1.931E-11	0.0000	1.481E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-09	0.0003
Pu-239	5.630E-10	0.0001	1.822E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.756E-08	0.0041
Pu-241	1.656E-09	0.0004	2.628E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.849E-10	0.0001
Se-79	2.626E-23	0.0000	5.542E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.233E-22	0.0000
Sn-126	2.039E-17	0.0000	1.151E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.336E-21	0.0000
Sr-90	2.888E-11	0.0000	7.676E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.150E-12	0.0000
Tc-99	1.942E-22	0.0000	1.063E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.406E-22	0.0000
U-233	9.601E-08	0.0225	1.116E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-08	0.0027
U-234	4.908E-09	0.0011	8.846E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.329E-09	0.0022
U-235	1.489E-06	0.3483	8.487E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.966E-09	0.0023
U-238	3.014E-07	0.0705	7.504E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.168E-08	0.0027
Total	4.194E-06	0.9811	7.322E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.096E-08	0.0189

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 42
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.633E-08	0.0132
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.078E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.958E-09	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.505E-09	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-06	0.5277
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.482E-09	0.0003
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-08	0.0042
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.941E-09	0.0005
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-17	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.403E-11	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.348E-22	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E-07	0.0251
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.424E-08	0.0033
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.499E-06	0.3506
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-07	0.0732
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.275E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  08:41  Page  43
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.196E-08	0.000E+00	0.000E+00	0.000E+00	6.701E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.701E-02
Am-241	2.676E-07	0.000E+00	0.000E+00	0.000E+00	8.165E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.165E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	1.010E-16	0.000E+00	0.000E+00	0.000E+00	3.082E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.082E-10
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	8.438E-11	0.000E+00	0.000E+00	0.000E+00	2.575E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.575E-04
Ni-63	6.927E-10	0.000E+00	0.000E+00	0.000E+00	2.113E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.113E-03
Np-237	1.302E-06	0.000E+00	0.000E+00	0.000E+00	3.971E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.971E+00
Pa-231	2.289E-08	0.000E+00	0.000E+00	0.000E+00	6.984E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.984E-02
Pb-210	1.915E-09	0.000E+00	0.000E+00	0.000E+00	5.844E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.844E-03
Pu-238	4.768E-10	0.000E+00	0.000E+00	0.000E+00	1.455E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.455E-03
Pu-239	1.250E-06	0.000E+00	0.000E+00	0.000E+00	3.813E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.813E+00
Pu-241	1.601E-27	0.000E+00	0.000E+00	0.000E+00	4.885E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.885E-21
Ra-226	2.033E-09	0.000E+00	0.000E+00	0.000E+00	6.204E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.204E-03
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	4.051E-17	0.000E+00	0.000E+00	0.000E+00	1.236E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.236E-10
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	1.098E-07	0.000E+00	0.000E+00	0.000E+00	3.351E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.351E-01
Th-230	1.094E-08	0.000E+00	0.000E+00	0.000E+00	3.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.338E-02
U-233	1.094E-06	0.000E+00	0.000E+00	0.000E+00	3.337E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.337E+00
U-234	1.094E-06	0.000E+00	0.000E+00	0.000E+00	3.337E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.337E+00
U-235	1.093E-06	0.000E+00	0.000E+00	0.000E+00	3.336E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.336E+00
U-238	1.093E-06	0.000E+00	0.000E+00	0.000E+00	3.336E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.336E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 44
Intrisk : Residual Dose and Risk Assessment for Industrial Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\INDUSTRIAL_WORKER.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.848E-08	0.0164	1.180E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.105E-09	0.0003
Am-241	1.552E-08	0.0037	2.471E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.679E-09	0.0006
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.029E-16	0.0000	2.143E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.184E-19	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.005E-12	0.0000	2.998E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.841E-12	0.0000
Ni-63	0.000E+00	0.0000	9.102E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-14	0.0000
Np-237	2.181E-06	0.5229	9.338E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.033E-09	0.0022
Pa-231	6.743E-09	0.0016	4.402E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.984E-10	0.0001
Pb-210	1.748E-11	0.0000	1.506E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.144E-10	0.0001
Pu-238	7.000E-14	0.0000	5.643E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.574E-12	0.0000
Pu-239	5.307E-10	0.0001	1.719E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.657E-08	0.0040
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	3.681E-08	0.0088	1.469E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.159E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.239E-18	0.0000	3.292E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	2.717E-07	0.0651	6.375E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.062E-09	0.0015
Th-230	1.933E-11	0.0000	9.403E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-10	0.0000
U-233	2.280E-09	0.0005	7.717E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.062E-09	0.0019
U-234	5.924E-10	0.0001	7.581E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.946E-09	0.0019
U-235	1.257E-06	0.3015	6.815E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.121E-09	0.0019
U-238	2.590E-07	0.0621	6.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.003E-08	0.0024
Total	4.100E-06	0.9830	6.568E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.071E-08	0.0170

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 45
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.959E-08	0.0167
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-08	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.031E-16	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.846E-12	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-14	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.190E-06	0.5251
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.142E-09	0.0017
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.319E-10	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.644E-12	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-08	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.689E-08	0.0088
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.777E-07	0.0666
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.198E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.034E-08	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.539E-09	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-06	0.3034
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.690E-07	0.0645
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.171E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 46
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.535E-08	0.0037	2.390E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.591E-09	0.0006
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.029E-16	0.0000	2.143E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.184E-19	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.005E-12	0.0000	2.998E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.841E-12	0.0000
Ni-63	0.000E+00	0.0000	9.102E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-14	0.0000
Np-237	2.181E-06	0.5230	9.388E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.085E-09	0.0022
Pu-238	1.081E-11	0.0000	8.449E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.676E-12	0.0000
Pu-239	5.321E-10	0.0001	1.719E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.657E-08	0.0040
Pu-241	5.287E-10	0.0001	8.236E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.931E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.239E-18	0.0000	3.292E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	2.733E-07	0.0655	1.404E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-08	0.0034
U-234	3.739E-08	0.0090	7.680E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.615E-09	0.0021
U-235	1.333E-06	0.3195	8.436E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.624E-09	0.0023
U-238	2.590E-07	0.0621	6.463E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.005E-08	0.0024
Total	4.100E-06	0.9830	6.568E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.071E-08	0.0170

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 08:41 Page 47
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.795E-08	0.0043
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.031E-16	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.846E-12	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-14	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.190E-06	0.5252
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-11	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-08	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.180E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.874E-07	0.0689
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.601E-08	0.0110
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.342E-06	0.3218
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-07	0.0645
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.171E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-2: Results of Radiological Risk Assessment for CERCLA Construction Worker

Table D-2-1: Radiological Risk Assessments For Construction Worker - EA A Plus B

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0.18	7E-10	2E-11	4E-10	1E-09	1.E-10	4.E-12	8.E-11	2.E-10	1E-10	5E-12	8E-11	2E-10	2.E-11	8.E-13	2.E-11	4.E-11
C-14	3.4	1E-13	2E-12	3E-12	6E-12	4.E-13	8.E-12	1.E-11	2.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	6E-08	7E-14	1E-10	6E-08	2.E-06	2.E-12	3.E-09	2.E-06	5E-18	5E-24	9E-21	5E-18	1.E-16	1.E-22	3.E-19	1.E-16
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	5E-12	4E-11	6E-10	6E-10	2.E-12	1.E-11	2.E-10	2.E-10	5E-12	3E-11	5E-10	6E-10	1.E-12	1.E-11	2.E-10	2.E-10
Pu-241	1.2	9E-13	6E-13	8E-12	9E-12	1.E-12	7.E-13	9.E-12	1.E-11	5E-12	2E-13	3E-12	8E-12	6.E-12	2.E-13	3.E-12	9.E-12
Se-79	2.4	3E-13	1E-14	3E-11	3E-11	6.E-13	3.E-14	7.E-11	7.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	2E-07	3E-13	1E-10	2E-07	7.E-06	8.E-12	4.E-09	7.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	5E-10	3E-13	3E-10	8E-10	8.E-09	5.E-12	5.E-09	1.E-08	1E-20	8E-24	9E-21	2E-20	2.E-19	1.E-22	2.E-19	4.E-19
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-11	2E-11	3E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-11	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	6E-12	2E-11	3E-10	3E-10	2.E-12	5.E-12	8.E-11	9.E-11	3E-10	1E-11	3E-10	6E-10	8.E-11	4.E-12	7.E-11	2.E-10
U-235	0.0089	1E-08	2E-11	3E-10	1E-08	1.E-10	1.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	1.E-13	3.E-12	1.E-10
U-238	0.19	3E-09	2E-11	4E-10	3E-09	5.E-10	3.E-12	8.E-11	6.E-10	2E-09	1E-11	3E-10	3E-09	4.E-10	2.E-12	6.E-11	5.E-10
				Excess Cancer Risk		**8.E-06**	**5.E-11**	**1.E-08**	**8.E-06**			**Excess Cancer Risk**		**7.E-10**	**2.E-11**	**3.E-10**	**1.E-09**

Table D-2-2: Radiological Risk Assessments For Construction Worker - EA C

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-13	2E-12	3E-12	6E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	6E-08	7E-14	1E-10	6E-08	4.E-07	5.E-13	9.E-10	4.E-07	5E-18	5E-24	9E-21	5E-18	3.E-17	4.E-23	6.E-20	3.E-17
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	4E-15	3E-12	3E-12	0.E+00	2.E-14	1.E-11	1.E-11	0E+00	2E-18	2E-15	2E-15	0.E+00	8.E-18	7.E-15	7.E-15
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	3E-13	1E-14	3E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	2E-07	3E-13	1E-10	2E-07	1.E-05	1.E-11	7.E-09	1.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	5E-10	3E-13	3E-10	8E-10	1.E-09	8.E-13	9.E-10	2.E-09	1E-20	8E-24	9E-21	2E-20	4.E-20	2.E-23	3.E-20	7.E-20
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-11	2E-11	3E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-11	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	6E-12	2E-11	3E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	3E-10	1E-11	3E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	1E-08	2E-11	3E-10	1E-08	2.E-10	2.E-13	4.E-12	2.E-10	1E-08	2E-11	3E-10	1E-08	2.E-10	2.E-13	4.E-12	2.E-10
U-238	0.28	3E-09	2E-11	4E-10	3E-09	8.E-10	4.E-12	1.E-10	9.E-10	2E-09	1E-11	3E-10	3E-09	6.E-10	3.E-12	9.E-11	7.E-10
				Excess Cancer Risk		**1.E-05**	**2.E-11**	**9.E-09**	**1.E-05**			**Excess Cancer Risk**		**8.E-10**	**4.E-12**	**9.E-11**	**9.E-10**

Table D-2-3: Radiological Risk Assessments For Construction Worker - EA E

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-13	2E-12	3E-12	6E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	6E-08	7E-14	1E-10	6E-08	3.E-07	4.E-13	6.E-10	3.E-07	5E-18	5E-24	9E-21	5E-18	2.E-17	3.E-23	5.E-20	2.E-17
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	3E-13	1E-14	3E-11	3E-11	1.E-12	5.E-14	1.E-10	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	2E-07	3E-13	1E-10	2E-07	4.E-06	5.E-12	2.E-09	4.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	5E-10	3E-13	3E-10	8E-10	1.E-09	7.E-13	8.E-10	2.E-09	1E-20	8E-24	9E-21	2E-20	4.E-20	2.E-23	2.E-20	6.E-20
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	3E-11	2E-11	3E-10	4E-10	5.E-11	4.E-11	6.E-10	7.E-10	2E-09	3E-11	4E-10	3E-09	5.E-09	5.E-11	9.E-10	6.E-09
U-234	0.45	6E-12	2E-11	3E-10	3E-10	3.E-12	8.E-12	1.E-10	2.E-10	3E-10	1E-11	3E-10	6E-10	1.E-10	7.E-12	1.E-10	3.E-10
U-235	0.0012	1E-08	2E-11	3E-10	1E-08	2.E-11	2.E-14	4.E-13	2.E-11	1E-08	2E-11	3E-10	1E-08	1.E-11	2.E-14	4.E-13	1.E-11
U-238	0.28	3E-09	2E-11	4E-10	3E-09	8.E-10	4.E-12	1.E-10	9.E-10	2E-09	1E-11	3E-10	3E-09	6.E-10	3.E-12	9.E-11	7.E-10
				Excess Cancer Risk		**4.E-06**	**5.E-11**	**5.E-09**	**4.E-06**			**Excess Cancer Risk**		**6.E-09**	**6.E-11**	**1.E-09**	**7.E-09**

Table D-2-4: Radiological Risk Assessments For Construction Worker - EA F Plus G

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	1E-13	2E-12	3E-12	6E-12	1.E-12	3.E-11	4.E-11	7.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	6E-08	7E-14	1E-10	6E-08	2.E-07	2.E-13	4.E-10	2.E-07	5E-18	5E-24	9E-21	5E-18	1.E-17	2.E-23	3.E-20	1.E-17
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	3E-13	1E-14	3E-11	3E-11	6.E-13	3.E-14	7.E-11	7.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	2E-07	3E-13	1E-10	2E-07	5.E-07	7.E-13	3.E-10	5.E-07	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	5E-10	3E-13	3E-10	8E-10	1.E-10	8.E-14	9.E-11	2.E-10	1E-20	8E-24	9E-21	2E-20	4.E-21	2.E-24	3.E-21	7.E-21
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	3E-11	2E-11	3E-10	4E-10	4.E-11	3.E-11	5.E-10	5.E-10	2E-09	3E-11	4E-10	3E-09	4.E-09	4.E-11	7.E-10	4.E-09
U-234	0.3	6E-12	2E-11	3E-10	3E-10	2.E-12	5.E-12	9.E-11	1.E-10	3E-10	1E-11	3E-10	6E-10	1.E-10	4.E-12	8.E-11	2.E-10
U-235	0.01	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10
U-238	0.24	3E-09	2E-11	4E-10	3E-09	7.E-10	4.E-12	1.E-10	8.E-10	2E-09	1E-11	3E-10	3E-09	5.E-10	3.E-12	8.E-11	6.E-10
				Excess Cancer Risk		**7.E-07**	**7.E-11**	**2.E-09**	**7.E-07**			**Excess Cancer Risk**		**4.E-09**	**5.E-11**	**8.E-10**	**5.E-09**

Table D-2-5: Radiological Risk Assessments For Construction Worker - EA H Plus I

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	1E-13	2E-12	3E-12	6E-12	4.E-13	8.E-12	1.E-11	2.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-08	7E-14	1E-10	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-18	5E-24	9E-21	5E-18	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	1E-10	3E-13	1E-10	0.E+00	8.E-09	2.E-11	8.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	3E-13	1E-14	3E-11	3E-11	7.E-13	3.E-14	8.E-11	8.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	2E-07	3E-13	1E-10	2E-07	2.E-06	2.E-12	1.E-09	2.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	5E-10	3E-13	3E-10	8E-10	0.E+00	0.E+00	0.E+00	0.E+00	1E-20	8E-24	9E-21	2E-20	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	3E-11	2E-11	3E-10	4E-10	4.E-11	3.E-11	5.E-10	6.E-10	2E-09	3E-11	4E-10	3E-09	4.E-09	4.E-11	7.E-10	5.E-09
U-234	0.35	6E-12	2E-11	3E-10	3E-10	2.E-12	6.E-12	1.E-10	1.E-10	3E-10	1E-11	3E-10	6E-10	1.E-10	5.E-12	1.E-10	2.E-10
U-235	0.0078	1E-08	2E-11	3E-10	1E-08	1.E-10	1.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	9.E-11	1.E-13	2.E-12	9.E-11
U-238	0.18	3E-09	2E-11	4E-10	3E-09	5.E-10	3.E-12	7.E-11	6.E-10	2E-09	1E-11	3E-10	3E-09	4.E-10	2.E-12	6.E-11	5.E-10
				Excess Cancer Risk		**2.E-06**	**8.E-09**	**2.E-09**	**2.E-06**			**Excess Cancer Risk**		**4.E-09**	**5.E-11**	**9.E-10**	**5.E-09**

Table D-2-6: Radiological Risk Assessments For Construction Worker - EA J

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	1E-13	2E-12	3E-12	6E-12	1.E-12	3.E-11	5.E-11	8.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	6E-08	7E-14	1E-10	6E-08	4.E-07	4.E-13	7.E-10	4.E-07	5E-18	5E-24	9E-21	5E-18	3.E-17	3.E-23	5.E-20	3.E-17
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-12	3E-11	6E-10	6E-10	1.E-13	2.E-12	4.E-11	4.E-11	9E-14	2E-14	3E-13	4E-13	6.E-15	1.E-15	2.E-14	3.E-14
Pu-239	0.038	5E-12	4E-11	6E-10	6E-10	2.E-13	1.E-12	2.E-11	2.E-11	5E-12	3E-11	5E-10	6E-10	2.E-13	1.E-12	2.E-11	2.E-11
Pu-241	0.14	9E-13	6E-13	8E-12	9E-12	1.E-13	8.E-14	1.E-12	1.E-12	5E-12	2E-13	3E-12	8E-12	7.E-13	2.E-14	4.E-13	1.E-12
Se-79	11.3	3E-13	1E-14	3E-11	3E-11	3.E-12	1.E-13	3.E-10	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	2E-07	3E-13	1E-10	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	5E-10	3E-13	3E-10	8E-10	2.E-09	1.E-12	1.E-09	3.E-09	1E-20	8E-24	9E-21	2E-20	6.E-20	3.E-23	4.E-20	9.E-20
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-11	2E-11	3E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-11	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	6E-12	2E-11	3E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	3E-10	1E-11	3E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10
U-238	0.22	3E-09	2E-11	4E-10	3E-09	6.E-10	3.E-12	9.E-11	7.E-10	2E-09	1E-11	3E-10	3E-09	5.E-10	3.E-12	7.E-11	6.E-10
				Excess Cancer Risk		**4.E-07**	**4.E-11**	**2.E-09**	**4.E-07**			**Excess Cancer Risk**		**6.E-10**	**4.E-12**	**9.E-11**	**7.E-10**

Table D-2-7: Radiological Risk Assessments For Construction Worker - EA L1 Plus L2

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	1E-13	2E-12	3E-12	6E-12	6.E-12	1.E-10	2.E-10	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	6E-08	7E-14	1E-10	6E-08	2.E-07	2.E-13	4.E-10	2.E-07	5E-18	5E-24	9E-21	5E-18	2.E-17	2.E-23	3.E-20	2.E-17
H-3	4.7	0E+00	1E-10	3E-13	1E-10	0.E+00	5.E-10	1.E-12	5.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	4E-15	3E-12	3E-12	0.E+00	1.E-12	1.E-09	1.E-09	0E+00	2E-18	2E-15	2E-15	0.E+00	7.E-16	6.E-13	6.E-13
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	3E-13	1E-14	3E-11	3E-11	4.E-13	2.E-14	5.E-11	5.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	2E-07	3E-13	1E-10	2E-07	2.E-06	2.E-12	1.E-09	2.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	5E-10	3E-13	3E-10	8E-10	1.E-09	5.E-13	6.E-10	2.E-09	1E-20	8E-24	9E-21	2E-20	3.E-20	2.E-23	2.E-20	5.E-20
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	3E-11	2E-11	3E-10	4E-10	4.E-11	3.E-11	5.E-10	5.E-10	2E-09	3E-11	4E-10	3E-09	4.E-09	4.E-11	7.E-10	4.E-09
U-234	0.25	6E-12	2E-11	3E-10	3E-10	2.E-12	4.E-12	8.E-11	8.E-11	3E-10	1E-11	3E-10	6E-10	8.E-11	4.E-12	7.E-11	2.E-10
U-235	0.01	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10
U-238	0.23	3E-09	2E-11	4E-10	3E-09	7.E-10	3.E-12	9.E-11	7.E-10	2E-09	1E-11	3E-10	3E-09	5.E-10	3.E-12	7.E-11	6.E-10
				Excess Cancer Risk		**2.E-06**	**7.E-10**	**4.E-09**	**2.E-06**			**Excess Cancer Risk**		**4.E-09**	**5.E-11**	**8.E-10**	**5.E-09**

Table D-2-8: Radiological Risk Assessments For Construction Worker - EA P

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	2.2	7E-10	2E-11	4E-10	1E-09	2.E-09	5.E-11	1.E-09	3.E-09	1E-10	5E-12	8E-11	2E-10	3.E-10	1.E-11	2.E-10	5.E-10
C-14	0	1E-13	2E-12	3E-12	6E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	3E-07	6E-14	7E-11	3E-07	2.E-07	5.E-14	6.E-11	2.E-07	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	6E-08	7E-14	1E-10	6E-08	2.E-06	2.E-12	4.E-09	2.E-06	5E-18	5E-24	9E-21	5E-18	1.E-16	2.E-22	3.E-19	1.E-16
H-3	308	0E+00	1E-10	3E-13	1E-10	0.E+00	3.E-08	9.E-11	3.E-08	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	2E-10	1E-13	1E-09	1E-09	1.E-10	8.E-14	9.E-10	1.E-09	1E-14	6E-18	7E-14	8E-14	8.E-15	5.E-18	5.E-14	6.E-14
Ni-63	85	0E+00	4E-15	3E-12	3E-12	0.E+00	3.E-13	3.E-10	3.E-10	0E+00	2E-18	2E-15	2E-15	0.E+00	2.E-16	1.E-13	1.E-13
Np-237	1.5	2E-08	2E-11	3E-10	2E-08	3.E-08	3.E-11	5.E-10	3.E-08	2E-08	2E-11	3E-10	2E-08	3.E-08	3.E-11	4.E-10	3.E-08
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	5E-12	4E-11	6E-10	6E-10	5.E-11	4.E-10	6.E-09	7.E-09	5E-12	3E-11	5E-10	6E-10	5.E-11	3.E-10	6.E-09	6.E-09
Pu-241	39.9	9E-13	6E-13	8E-12	9E-12	4.E-11	2.E-11	3.E-10	4.E-10	5E-12	2E-13	3E-12	8E-12	2.E-10	6.E-12	1.E-10	3.E-10
Se-79	4.6	3E-13	1E-14	3E-11	3E-11	1.E-12	6.E-14	1.E-10	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	2E-07	3E-13	1E-10	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	5E-10	3E-13	3E-10	8E-10	4.E-08	2.E-11	3.E-08	6.E-08	1E-20	8E-24	9E-21	2E-20	1.E-18	7.E-22	8.E-19	2.E-18
Tc-99	24	2E-12	2E-14	1E-11	1E-11	5.E-11	6.E-13	3.E-10	4.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	3E-11	2E-11	3E-10	4E-10	5.E-11	3.E-11	6.E-10	7.E-10	2E-09	3E-11	4E-10	3E-09	5.E-09	5.E-11	8.E-10	5.E-09
U-234	0.72	6E-12	2E-11	3E-10	3E-10	5.E-12	1.E-11	2.E-10	2.E-10	3E-10	1E-11	3E-10	6E-10	2.E-10	1.E-11	2.E-10	4.E-10
U-235	0.025	1E-08	2E-11	3E-10	1E-08	3.E-10	4.E-13	8.E-12	4.E-10	1E-08	2E-11	3E-10	1E-08	3.E-10	4.E-13	8.E-12	3.E-10
U-238	0.52	3E-09	2E-11	4E-10	3E-09	1.E-09	8.E-12	2.E-10	2.E-09	2E-09	1E-11	3E-10	3E-09	1.E-09	6.E-12	2.E-10	1.E-09
				Excess Cancer Risk		**2.E-06**	**3.E-08**	**4.E-08**	**2.E-06**			**Excess Cancer Risk**		**4.E-08**	**5.E-10**	**8.E-09**	**4.E-08**

Table D-2-9: Radiological Risk Assessments For Construction Worker - EA R

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-13	2E-12	3E-12	6E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-08	7E-14	1E-10	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-18	5E-24	9E-21	5E-18	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	1E-10	3E-13	1E-10	0.E+00	3.E-10	7.E-13	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-11	3E-10	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	3E-13	1E-14	3E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	2E-07	3E-13	1E-10	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	5E-10	3E-13	3E-10	8E-10	2.E-10	1.E-13	1.E-10	3.E-10	1E-20	8E-24	9E-21	2E-20	5.E-21	3.E-24	3.E-21	9.E-21
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	3E-11	2E-11	3E-10	4E-10	6.E-11	4.E-11	8.E-10	9.E-10	2E-09	3E-11	4E-10	3E-09	6.E-09	6.E-11	1.E-09	7.E-09
U-234	0.22	6E-12	2E-11	3E-10	3E-10	1.E-12	4.E-12	7.E-11	7.E-11	3E-10	1E-11	3E-10	6E-10	7.E-11	3.E-12	6.E-11	1.E-10
U-235	0.01	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	2.E-13	3.E-12	1.E-10
U-238	0.22	3E-09	2E-11	4E-10	3E-09	6.E-10	3.E-12	9.E-11	7.E-10	2E-09	1E-11	3E-10	3E-09	5.E-10	3.E-12	7.E-11	6.E-10
				Excess Cancer Risk		**1.E-09**	**3.E-10**	**1.E-09**	**2.E-09**			**Excess Cancer Risk**		**6.E-09**	**7.E-11**	**1.E-09**	**8.E-09**

Table D-2-10: Radiological Risk Assessments For Construction Worker - EA U

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	7E-10	2E-11	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-10	5E-12	8E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	1E-13	2E-12	3E-12	6E-12	2.E-13	4.E-12	6.E-12	1.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-07	6E-14	7E-11	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	6E-08	7E-14	1E-10	6E-08	1.E-07	1.E-13	3.E-10	1.E-07	5E-18	5E-24	9E-21	5E-18	1.E-17	1.E-23	2.E-20	1.E-17
H-3	0	0E+00	1E-10	3E-13	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-10	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-14	6E-18	7E-14	8E-14	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	3E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	2E-18	2E-15	2E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	2E-08	2E-11	3E-10	2E-08	1.E-08	1.E-11	2.E-10	1.E-08	2E-08	2E-11	3E-10	2E-08	1.E-08	1.E-11	2.E-10	1.E-08
Pu-238	0	2E-12	3E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	9E-14	2E-14	3E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	5E-12	4E-11	6E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	3E-11	5E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	9E-13	6E-13	8E-12	9E-12	0.E+00	0.E+00	0.E+00	0.E+00	5E-12	2E-13	3E-12	8E-12	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	3E-13	1E-14	3E-11	3E-11	8.E-13	3.E-14	9.E-11	9.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	2E-07	3E-13	1E-10	2E-07	1.E-06	2.E-12	8.E-10	1.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	5E-10	3E-13	3E-10	8E-10	2.E-09	1.E-12	1.E-09	3.E-09	1E-20	8E-24	9E-21	2E-20	6.E-20	3.E-23	4.E-20	1.E-19
Tc-99	0	2E-12	2E-14	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	3E-11	2E-11	3E-10	4E-10	6.E-11	4.E-11	7.E-10	8.E-10	2E-09	3E-11	4E-10	3E-09	5.E-09	6.E-11	9.E-10	6.E-09
U-234	0.31	6E-12	2E-11	3E-10	3E-10	2.E-12	5.E-12	1.E-10	1.E-10	3E-10	1E-11	3E-10	6E-10	1.E-10	4.E-12	9.E-11	2.E-10
U-235	0.0089	1E-08	2E-11	3E-10	1E-08	1.E-10	1.E-13	3.E-12	1.E-10	1E-08	2E-11	3E-10	1E-08	1.E-10	1.E-13	3.E-12	1.E-10
U-238	0.21	3E-09	2E-11	4E-10	3E-09	6.E-10	3.E-12	8.E-11	7.E-10	2E-09	1E-11	3E-10	3E-09	5.E-10	3.E-12	7.E-11	5.E-10
				Excess Cancer Risk		**1.E-06**	**6.E-11**	**3.E-09**	**1.E-06**			**Excess Cancer Risk**		**2.E-08**	**7.E-11**	**1.E-09**	**2.E-08**

Table D-2-11: Maximum Risk Assessment Results for Construction Worker

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
External Gamma	8E-06	1E-05	4E-06	7E-07	2E-06	4E-07	2E-06	2E-06	6E-09	1E-06
Inhalation	5E-11	2E-11	5E-11	7E-11	8E-09	4E-11	7E-10	3E-08	7E-11	6E-11
Soil Ingestion	1E-08	9E-09	5E-09	2E-09	2E-09	2E-09	4E-09	4E-08	1E-09	3E-09
Cumulative	8E-06	1E-05	4E-06	7E-07	2E-06	4E-07	2E-06	2E-06	8E-09	1E-06
Major Risk Contributors	None									

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR CONSTRUCTION WORKER

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   1
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
```

Table of Contents

Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors 2
Risk Slope and ETFG for the Ground Pathway 6
Amount of Intake Quantities and Excess Cancer Risks
Time= 0.000E+00 8
Time= 1.000E+00 13
Time= 3.000E+00 18
Time= 1.000E+01 23
Time= 3.000E+01 28
Time= 1.000E+02 33
Time= 3.000E+02 38
Time= 1.000E+03 43

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 2
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 3
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   4
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

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Sf-3   U-235+D                                                    9.76E-11   9.44E-11   SLPF( 26,5)
Sf-3   U-238                                                      8.66E-11   8.66E-11   SLPF( 27,5)
Sf-3   U-238+D                                                    1.21E-10   8.66E-11   SLPF( 28,5)

Sf-Rn  Radon Inhalation slope factors, 1/(pCi):
Sf-Rn  Rn-222                                                     1.80E-12   1.80E-12   SLPFRN(1,1)
Sf-Rn  Po-218                                                     3.70E-12   3.70E-12   SLPFRN(1,2)
Sf-Rn  Pb-214                                                     6.20E-12   6.20E-12   SLPFRN(1,3)
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   5
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                    Current     Base      Parameter
  Menu                          Parameter                            Value      Case*       Name
 ---------------------------------------------------------------------------------------------------
 Sf-Rn  Bi-214                                                     1.50E-11   1.50E-11   SLPFRN(1,4)

 Sf-Rn  Radon K factors, (mrem/WLM):
 Sf-Rn  Rn-222 Indoor                                              7.60E+02   7.60E+02   KFACTR(1,1)
 Sf-Rn  Rn-222 Outdoor                                             5.70E+02   5.70E+02   KFACTR(1,2)
 ------Ï-------------------------------------------------------------Ï-----------Ï-----------Ï--------------
 *Base Case means Default.Lib w/o Associate Nuclide contributions.
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   6
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	2.537E-02	2.537E-02	2.537E-02	2.537E-02	2.537E-02	2.537E-02	2.537E-02	2.537E-02
Ac-227	3.480E-10	2.543E-02	2.543E-02	2.543E-02	2.543E-02	2.543E-02	2.543E-02	2.543E-02	2.543E-02
Am-241	2.760E-08	2.554E-02	2.554E-02	2.554E-02	2.554E-02	2.554E-02	2.554E-02	2.554E-02	2.554E-02
At-217	1.320E-09	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02	2.476E-02
At-218	3.570E-09	2.553E-02	2.553E-02	2.553E-02	2.553E-02	2.553E-02	2.553E-02	2.553E-02	2.553E-02
Ba-137m	2.690E-06	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02
Bi-210	2.760E-09	2.497E-02	2.497E-02	2.497E-02	2.497E-02	2.497E-02	2.497E-02	2.497E-02	2.497E-02
Bi-211	1.880E-07	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02
Bi-213	5.650E-07	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02
Bi-214	7.480E-06	2.483E-02	2.483E-02	2.483E-02	2.483E-02	2.483E-02	2.483E-02	2.483E-02	2.483E-02
C-14	7.830E-12	2.572E-02	2.572E-02	2.572E-02	2.572E-02	2.572E-02	2.572E-02	2.572E-02	2.572E-02
Co-60	1.240E-05	2.482E-02	2.482E-02	2.482E-02	2.482E-02	2.482E-02	2.482E-02	2.482E-02	2.482E-02
Cs-137	5.320E-10	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
Fr-221	1.110E-07	2.521E-02	2.521E-02	2.521E-02	2.521E-02	2.521E-02	2.521E-02	2.521E-02	2.521E-02
Fr-223	1.400E-07	2.513E-02	2.513E-02	2.513E-02	2.513E-02	2.513E-02	2.513E-02	2.513E-02	2.513E-02
H-3	0.000E+00	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02
I-129	6.100E-09	2.619E-02	2.619E-02	2.619E-02	2.619E-02	2.619E-02	2.619E-02	2.619E-02	2.619E-02
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02
Pa-231	1.390E-07	2.499E-02	2.499E-02	2.499E-02	2.499E-02	2.499E-02	2.499E-02	2.499E-02	2.499E-02
Pa-233	7.430E-07	2.503E-02	2.503E-02	2.503E-02	2.503E-02	2.503E-02	2.503E-02	2.503E-02	2.503E-02
Pa-234	8.710E-06	2.481E-02	2.481E-02	2.481E-02	2.481E-02	2.481E-02	2.481E-02	2.481E-02	2.481E-02
Pa-234m	6.870E-08	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02	2.478E-02
Pb-209	5.370E-10	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02
Pb-210	1.410E-09	2.575E-02	2.575E-02	2.575E-02	2.575E-02	2.575E-02	2.575E-02	2.575E-02	2.575E-02
Pb-211	2.290E-07	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02
Pb-214	9.820E-07	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02	2.498E-02
Po-210	3.950E-11	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02
Po-211	3.580E-08	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02
Po-215	7.480E-10	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02
Po-218	4.260E-11	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02
Pu-238	7.220E-11	2.669E-02	2.669E-02	2.669E-02	2.669E-02	2.669E-02	2.669E-02	2.669E-02	2.669E-02
Pu-239	2.000E-10	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02
Pu-241	4.110E-12	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02	2.545E-02
Ra-223	4.340E-07	2.512E-02	2.512E-02	2.512E-02	2.512E-02	2.512E-02	2.512E-02	2.512E-02	2.512E-02
Ra-225	5.910E-09	2.571E-02	2.571E-02	2.571E-02	2.571E-02	2.571E-02	2.571E-02	2.571E-02	2.571E-02
Ra-226	2.290E-08	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02
Rn-219	2.250E-07	2.500E-02	2.500E-02	2.500E-02	2.500E-02	2.500E-02	2.500E-02	2.500E-02	2.500E-02
Rn-222	1.740E-09	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02
Sb-126	1.280E-05	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02	2.462E-02
Sb-126m	6.940E-06	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02	2.464E-02

Se-79	1.100E-11	2.551E-02	2.551E-02	2.551E-02	2.551E-02	2.551E-02	2.551E-02	2.551E-02	2.551E-02
Sn-126	9.960E-08	2.548E-02	2.548E-02	2.548E-02	2.548E-02	2.548E-02	2.548E-02	2.548E-02	2.548E-02
Sr-90	4.820E-10	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02
Tc-99	8.140E-11	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02
Th-227	3.780E-07	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
Th-229	2.250E-07	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02
Th-230	8.190E-10	2.541E-02	2.541E-02	2.541E-02	2.541E-02	2.541E-02	2.541E-02	2.541E-02	2.541E-02

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   7
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	2.547E-02	2.547E-02	2.547E-02	2.547E-02	2.547E-02	2.547E-02	2.547E-02	2.547E-02
Th-234	1.630E-08	2.546E-02	2.546E-02	2.546E-02	2.546E-02	2.546E-02	2.546E-02	2.546E-02	2.546E-02
Tl-207	1.520E-08	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02
Tl-209	9.830E-06	2.492E-02	2.492E-02	2.492E-02	2.492E-02	2.492E-02	2.492E-02	2.492E-02	2.492E-02
Tl-210	0.000E+00	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02	2.740E-02
U-233	9.820E-10	2.534E-02	2.534E-02	2.534E-02	2.534E-02	2.534E-02	2.534E-02	2.534E-02	2.534E-02
U-234	2.520E-10	2.566E-02	2.566E-02	2.566E-02	2.566E-02	2.566E-02	2.566E-02	2.566E-02	2.566E-02
U-235	5.180E-07	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02	2.530E-02
U-237	3.760E-07	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02	2.531E-02
U-238	4.990E-11	2.660E-02	2.660E-02	2.660E-02	2.660E-02	2.660E-02	2.660E-02	2.660E-02	2.660E-02
Y-90	1.910E-08	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02	2.477E-02

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   8
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
C-14	2.486E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Co-60	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Cs-137	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
H-3	2.087E+02	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
I-129	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Ni-63	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Np-237	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pu-239	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pu-241	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Sn-126	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Sr-90	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Tc-99	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-234	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-235	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-238	6.378E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page   9
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.093E-15	0.0000	1.512E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.400E-16	0.0000
Am-241	7.048E-10	0.0012	2.404E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.422E-10	0.0007
C-14	1.066E-13	0.0000	2.334E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.494E-12	0.0000
Co-60	2.883E-07	0.4793	6.035E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.896E-11	0.0001
Cs-137	6.193E-08	0.1029	7.060E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.220E-10	0.0002
H-3	0.000E+00	0.0000	1.098E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-13	0.0000
I-129	1.590E-10	0.0003	1.016E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.058E-09	0.0018
Ni-63	0.000E+00	0.0000	3.666E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.127E-12	0.0000
Np-237	1.996E-08	0.0332	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.005E-10	0.0005
Pa-231	3.675E-14	0.0000	5.141E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.890E-15	0.0000
Pb-210	5.330E-22	0.0000	9.844E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.703E-20	0.0000
Pu-238	1.920E-12	0.0000	3.316E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.555E-10	0.0009
Pu-239	5.061E-12	0.0000	3.514E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.742E-10	0.0010
Pu-241	3.298E-13	0.0000	5.392E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.347E-12	0.0000
Ra-226	1.370E-16	0.0000	1.172E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-18	0.0000
Se-79	2.684E-13	0.0000	1.214E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.059E-11	0.0001
Sn-126	2.082E-07	0.3461	2.518E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-10	0.0002
Sr-90	4.795E-10	0.0008	2.731E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.107E-10	0.0005
Tc-99	1.980E-12	0.0000	2.324E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.263E-11	0.0000
Th-229	1.376E-12	0.0000	6.919E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-13	0.0000
Th-230	9.365E-17	0.0000	9.759E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.768E-15	0.0000
U-233	2.488E-11	0.0000	1.805E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.198E-10	0.0005
U-234	6.465E-12	0.0000	1.773E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-10	0.0005
U-235	1.373E-08	0.0228	1.594E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.222E-10	0.0005
U-238	2.827E-09	0.0047	1.507E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.980E-10	0.0007
Total	5.964E-07	0.9913	2.909E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.968E-09	0.0083

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 10
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.348E-15	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.171E-09	0.0019
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.934E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.884E-07	0.4794
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.205E-08	0.1031
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-10	0.0002
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E-09	0.0020
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.130E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-08	0.0337
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.515E-14	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.766E-20	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.906E-10	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.144E-10	0.0010
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.216E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-16	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.087E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-07	0.3463
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.905E-10	0.0013
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.494E-12	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.959E-15	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.627E-10	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.393E-10	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-08	0.0234
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E-09	0.0054
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.016E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 11
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.043E-10	0.0012	2.402E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.419E-10	0.0007
C-14	1.066E-13	0.0000	2.334E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.494E-12	0.0000
Co-60	2.883E-07	0.4793	6.035E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.896E-11	0.0001
Cs-137	6.193E-08	0.1029	7.060E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.220E-10	0.0002
H-3	0.000E+00	0.0000	1.098E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-13	0.0000
I-129	1.590E-10	0.0003	1.016E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.058E-09	0.0018
Ni-63	0.000E+00	0.0000	3.666E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.127E-12	0.0000
Np-237	1.996E-08	0.0332	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.005E-10	0.0005
Pu-238	1.920E-12	0.0000	3.316E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.555E-10	0.0009
Pu-239	5.061E-12	0.0000	3.514E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.742E-10	0.0010
Pu-241	8.857E-13	0.0000	5.582E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.696E-12	0.0000
Se-79	2.684E-13	0.0000	1.214E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.059E-11	0.0001
Sn-126	2.082E-07	0.3461	2.518E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-10	0.0002
Sr-90	4.795E-10	0.0008	2.731E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.107E-10	0.0005
Tc-99	1.980E-12	0.0000	2.324E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.263E-11	0.0000
U-233	2.626E-11	0.0000	1.805E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.199E-10	0.0005
U-234	6.465E-12	0.0000	1.773E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-10	0.0005
U-235	1.373E-08	0.0228	1.594E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.222E-10	0.0005
U-238	2.827E-09	0.0047	1.507E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.980E-10	0.0007
Total	5.964E-07	0.9913	2.909E-10	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.968E-09	0.0083

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 12
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.170E-09	0.0019
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.934E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.884E-07	0.4794
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.205E-08	0.1031
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-10	0.0002
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E-09	0.0020
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.130E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-08	0.0337
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.906E-10	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.144E-10	0.0010
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.140E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.087E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-07	0.3463
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.905E-10	0.0013
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.463E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.642E-10	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.393E-10	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.407E-08	0.0234
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E-09	0.0054
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.016E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 13
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.125E-10	0.000E+00	0.000E+00	0.000E+00	1.099E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.099E-06
Am-241	6.377E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
C-14	5.871E-01	0.000E+00	0.000E+00	0.000E+00	7.795E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.795E-01
Co-60	5.591E-04	0.000E+00	0.000E+00	0.000E+00	2.893E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.893E+00
Cs-137	6.231E-04	0.000E+00	0.000E+00	0.000E+00	3.224E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.224E+00
H-3	7.273E+01	0.000E+00	0.000E+00	0.000E+00	1.150E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.150E+00
I-129	6.316E-04	0.000E+00	0.000E+00	0.000E+00	3.269E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.269E+00
Ni-63	6.330E-04	0.000E+00	0.000E+00	0.000E+00	3.275E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.275E+00
Np-237	6.377E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pa-231	1.349E-08	0.000E+00	0.000E+00	0.000E+00	6.981E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.981E-05
Pb-210	1.278E-14	0.000E+00	0.000E+00	0.000E+00	6.615E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.615E-11
Pu-238	6.327E-04	0.000E+00	0.000E+00	0.000E+00	3.274E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.274E+00
Pu-239	6.377E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pu-241	6.078E-04	0.000E+00	0.000E+00	0.000E+00	3.145E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.145E+00
Ra-226	1.243E-12	0.000E+00	0.000E+00	0.000E+00	6.434E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.434E-09
Se-79	5.831E-04	0.000E+00	0.000E+00	0.000E+00	3.017E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.017E+00
Sn-126	5.831E-04	0.000E+00	0.000E+00	0.000E+00	3.017E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.017E+00
Sr-90	6.225E-04	0.000E+00	0.000E+00	0.000E+00	3.221E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.221E+00
Tc-99	5.831E-04	0.000E+00	0.000E+00	0.000E+00	3.017E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.017E+00
Th-229	6.022E-08	0.000E+00	0.000E+00	0.000E+00	3.116E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.116E-04
Th-230	5.741E-09	0.000E+00	0.000E+00	0.000E+00	2.971E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.971E-05
U-233	6.376E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-234	6.376E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-235	6.376E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
U-238	6.376E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 14
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.838E-14	0.0000	1.048E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.664E-15	0.0000
Am-241	7.047E-10	0.0013	2.404E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.422E-10	0.0008
C-14	2.518E-14	0.0000	5.511E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.251E-13	0.0000
Co-60	2.527E-07	0.4624	5.290E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-11	0.0001
Cs-137	6.050E-08	0.1107	6.898E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-10	0.0002
H-3	0.000E+00	0.0000	3.824E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-13	0.0000
I-129	1.574E-10	0.0003	1.006E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-09	0.0019
Ni-63	0.000E+00	0.0000	3.638E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.103E-12	0.0000
Np-237	1.996E-08	0.0365	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-10	0.0005
Pa-231	1.102E-13	0.0000	1.542E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.366E-14	0.0000
Pb-210	7.941E-21	0.0000	1.467E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-19	0.0000
Pu-238	1.904E-12	0.0000	3.290E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.511E-10	0.0010
Pu-239	5.061E-12	0.0000	3.514E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.742E-10	0.0011
Pu-241	3.142E-13	0.0000	5.138E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.001E-12	0.0000
Ra-226	9.591E-16	0.0000	8.200E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.726E-18	0.0000
Se-79	2.454E-13	0.0000	1.110E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.796E-11	0.0001
Sn-126	1.903E-07	0.3482	2.302E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-10	0.0002
Sr-90	4.680E-10	0.0009	2.665E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.033E-10	0.0006
Tc-99	1.811E-12	0.0000	2.125E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-11	0.0000
Th-229	4.127E-12	0.0000	2.075E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.347E-13	0.0000
Th-230	2.809E-16	0.0000	2.927E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.302E-15	0.0000
U-233	2.487E-11	0.0000	1.804E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.197E-10	0.0006
U-234	6.463E-12	0.0000	1.772E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-10	0.0006
U-235	1.372E-08	0.0251	1.594E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.221E-10	0.0006
U-238	2.827E-09	0.0052	1.507E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.979E-10	0.0007
Total	5.415E-07	0.9906	2.172E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.917E-09	0.0090

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 15
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.015E-14	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.171E-09	0.0021
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.528E-07	0.4625
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.062E-08	0.1109
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-11	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-09	0.0022
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.107E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-08	0.0371
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.354E-13	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.590E-19	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.859E-10	0.0011
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.144E-10	0.0011
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.829E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.669E-16	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.822E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.905E-07	0.3484
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.716E-10	0.0014
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.482E-12	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.876E-15	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.626E-10	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.393E-10	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0257
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.240E-09	0.0059
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.466E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 16
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.031E-10	0.0013	2.398E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.411E-10	0.0008
C-14	2.518E-14	0.0000	5.511E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.251E-13	0.0000
Co-60	2.527E-07	0.4624	5.290E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.045E-11	0.0001
Cs-137	6.050E-08	0.1107	6.898E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-10	0.0002
H-3	0.000E+00	0.0000	3.824E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-13	0.0000
I-129	1.574E-10	0.0003	1.006E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-09	0.0019
Ni-63	0.000E+00	0.0000	3.638E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.103E-12	0.0000
Np-237	1.996E-08	0.0365	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-10	0.0005
Pu-238	1.904E-12	0.0000	3.290E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.511E-10	0.0010
Pu-239	5.061E-12	0.0000	3.514E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.742E-10	0.0011
Pu-241	1.946E-12	0.0000	5.695E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.025E-12	0.0000
Se-79	2.454E-13	0.0000	1.110E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.796E-11	0.0001
Sn-126	1.903E-07	0.3482	2.302E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-10	0.0002
Sr-90	4.680E-10	0.0009	2.665E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.033E-10	0.0006
Tc-99	1.811E-12	0.0000	2.125E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-11	0.0000
U-233	2.900E-11	0.0001	1.806E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-10	0.0006
U-234	6.465E-12	0.0000	1.772E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.151E-10	0.0006
U-235	1.372E-08	0.0251	1.594E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.222E-10	0.0006
U-238	2.827E-09	0.0052	1.507E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.979E-10	0.0007
Total	5.415E-07	0.9906	2.172E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.917E-09	0.0090

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 17
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.168E-09	0.0021
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.528E-07	0.4625
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.062E-08	0.1109
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-11	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-09	0.0022
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.107E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-08	0.0371
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.859E-10	0.0011
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.144E-10	0.0011
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.054E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.822E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.905E-07	0.3484
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.716E-10	0.0014
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.671E-10	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.393E-10	0.0006
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0257
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.240E-09	0.0059
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.466E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page  18
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.871E-09	0.000E+00	0.000E+00	0.000E+00	9.683E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.683E-06
Am-241	6.375E-04	0.000E+00	0.000E+00	0.000E+00	3.299E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.299E+00
C-14	3.269E-02	0.000E+00	0.000E+00	0.000E+00	4.341E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.341E-02
Co-60	4.296E-04	0.000E+00	0.000E+00	0.000E+00	2.223E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.223E+00
Cs-137	5.947E-04	0.000E+00	0.000E+00	0.000E+00	3.077E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.077E+00
H-3	8.817E+00	0.000E+00	0.000E+00	0.000E+00	1.394E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.394E-01
I-129	6.195E-04	0.000E+00	0.000E+00	0.000E+00	3.206E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.206E+00
Ni-63	6.234E-04	0.000E+00	0.000E+00	0.000E+00	3.226E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.226E+00
Np-237	6.377E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pa-231	4.046E-08	0.000E+00	0.000E+00	0.000E+00	2.093E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.093E-04
Pb-210	3.397E-13	0.000E+00	0.000E+00	0.000E+00	1.758E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.758E-09
Pu-238	6.227E-04	0.000E+00	0.000E+00	0.000E+00	3.223E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.223E+00
Pu-239	6.376E-04	0.000E+00	0.000E+00	0.000E+00	3.300E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.300E+00
Pu-241	5.519E-04	0.000E+00	0.000E+00	0.000E+00	2.856E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.856E+00
Ra-226	1.118E-11	0.000E+00	0.000E+00	0.000E+00	5.787E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.787E-08
Se-79	4.873E-04	0.000E+00	0.000E+00	0.000E+00	2.522E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.522E+00
Sn-126	4.873E-04	0.000E+00	0.000E+00	0.000E+00	2.522E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.522E+00
Sr-90	5.930E-04	0.000E+00	0.000E+00	0.000E+00	3.069E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.069E+00
Tc-99	4.873E-04	0.000E+00	0.000E+00	0.000E+00	2.522E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.522E+00
Th-229	1.806E-07	0.000E+00	0.000E+00	0.000E+00	9.346E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.346E-04
Th-230	1.722E-08	0.000E+00	0.000E+00	0.000E+00	8.910E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.910E-05
U-233	6.374E-04	0.000E+00	0.000E+00	0.000E+00	3.298E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.298E+00
U-234	6.374E-04	0.000E+00	0.000E+00	0.000E+00	3.298E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.298E+00
U-235	6.374E-04	0.000E+00	0.000E+00	0.000E+00	3.298E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.298E+00
U-238	6.374E-04	0.000E+00	0.000E+00	0.000E+00	3.298E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.298E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page  19
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.469E-13	0.0000	5.426E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.614E-15	0.0000
Am-241	7.044E-10	0.0016	2.403E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.420E-10	0.0010
C-14	1.401E-15	0.0000	3.067E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.592E-14	0.0000
Co-60	1.942E-07	0.4279	4.065E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.645E-11	0.0001
Cs-137	5.775E-08	0.1272	6.583E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-10	0.0003
H-3	0.000E+00	0.0000	4.635E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-14	0.0000
I-129	1.544E-10	0.0003	9.864E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-09	0.0023
Ni-63	0.000E+00	0.0000	3.584E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-12	0.0000
Np-237	1.996E-08	0.0440	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-10	0.0007
Pa-231	2.571E-13	0.0000	3.596E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.519E-14	0.0000
Pb-210	9.125E-20	0.0000	1.685E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.763E-18	0.0000
Pu-238	1.874E-12	0.0000	3.238E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.424E-10	0.0012
Pu-239	5.060E-12	0.0000	3.513E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.741E-10	0.0013
Pu-241	2.854E-13	0.0000	4.666E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.358E-12	0.0000
Ra-226	5.067E-15	0.0000	4.332E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.082E-17	0.0000
Se-79	2.051E-13	0.0000	9.275E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-11	0.0001
Sn-126	1.591E-07	0.3505	1.924E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.459E-11	0.0002
Sr-90	4.459E-10	0.0010	2.539E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.889E-10	0.0006
Tc-99	1.513E-12	0.0000	1.776E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.648E-12	0.0000
Th-229	9.626E-12	0.0000	4.841E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.807E-13	0.0000
Th-230	6.553E-16	0.0000	6.829E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.237E-14	0.0000
U-233	2.486E-11	0.0001	1.804E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.196E-10	0.0007
U-234	6.461E-12	0.0000	1.772E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.149E-10	0.0007
U-235	1.372E-08	0.0302	1.593E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-10	0.0007
U-238	2.826E-09	0.0062	1.506E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.978E-10	0.0009
Total	4.489E-07	0.9890	1.825E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.828E-09	0.0106

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 20
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-13	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.170E-09	0.0026
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.799E-14	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.943E-07	0.4280
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.786E-08	0.1275
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.647E-12	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-09	0.0026
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.060E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.027E-08	0.0447
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.158E-13	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.871E-18	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.767E-10	0.0013
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.143E-10	0.0014
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.110E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.108E-15	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.359E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.592E-07	0.3507
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.351E-10	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.046E-11	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.625E-10	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.391E-10	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0310
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.238E-09	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.539E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 21
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.008E-10	0.0015	2.390E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.397E-10	0.0010
C-14	1.401E-15	0.0000	3.067E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.592E-14	0.0000
Co-60	1.942E-07	0.4279	4.065E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.645E-11	0.0001
Cs-137	5.775E-08	0.1272	6.583E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-10	0.0003
H-3	0.000E+00	0.0000	4.635E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.240E-14	0.0000
I-129	1.544E-10	0.0003	9.864E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-09	0.0023
Ni-63	0.000E+00	0.0000	3.584E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-12	0.0000
Np-237	1.996E-08	0.0440	1.831E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-10	0.0007
Pu-238	1.874E-12	0.0000	3.238E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.424E-10	0.0012
Pu-239	5.060E-12	0.0000	3.513E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.741E-10	0.0013
Pu-241	3.913E-12	0.0000	5.904E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.634E-12	0.0000
Se-79	2.051E-13	0.0000	9.275E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-11	0.0001
Sn-126	1.591E-07	0.3505	1.924E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.459E-11	0.0002
Sr-90	4.459E-10	0.0010	2.539E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.889E-10	0.0006
Tc-99	1.513E-12	0.0000	1.776E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.648E-12	0.0000
U-233	3.449E-11	0.0001	1.808E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.203E-10	0.0007
U-234	6.466E-12	0.0000	1.772E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.150E-10	0.0007
U-235	1.372E-08	0.0302	1.594E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.221E-10	0.0007
U-238	2.826E-09	0.0062	1.506E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.978E-10	0.0009
Total	4.489E-07	0.9890	1.825E-10	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.828E-09	0.0106

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 22
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E-09	0.0026
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.799E-14	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.943E-07	0.4280
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.786E-08	0.1275
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.647E-12	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-09	0.0026
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.060E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.027E-08	0.0447
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.767E-10	0.0013
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.143E-10	0.0014
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.314E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.359E-11	0.0001
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.592E-07	0.3507
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.351E-10	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.729E-10	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.391E-10	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0310
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.238E-09	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.539E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 23
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.931E-08	0.000E+00	0.000E+00	0.000E+00	9.991E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.991E-05
Am-241	6.353E-04	0.000E+00	0.000E+00	0.000E+00	3.288E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.288E+00
C-14	1.306E-06	0.000E+00	0.000E+00	0.000E+00	1.734E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.734E-06
Co-60	1.709E-04	0.000E+00	0.000E+00	0.000E+00	8.841E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.841E-01
Cs-137	5.051E-04	0.000E+00	0.000E+00	0.000E+00	2.614E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.614E+00
H-3	5.403E-03	0.000E+00	0.000E+00	0.000E+00	8.543E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.543E-05
I-129	5.789E-04	0.000E+00	0.000E+00	0.000E+00	2.996E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.996E+00
Ni-63	5.912E-04	0.000E+00	0.000E+00	0.000E+00	3.059E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.059E+00
Np-237	6.375E-04	0.000E+00	0.000E+00	0.000E+00	3.299E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.299E+00
Pa-231	1.346E-07	0.000E+00	0.000E+00	0.000E+00	6.967E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.967E-04
Pb-210	1.192E-11	0.000E+00	0.000E+00	0.000E+00	6.166E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.166E-08
Pu-238	5.890E-04	0.000E+00	0.000E+00	0.000E+00	3.048E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.048E+00
Pu-239	6.372E-04	0.000E+00	0.000E+00	0.000E+00	3.298E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.298E+00
Pu-241	3.939E-04	0.000E+00	0.000E+00	0.000E+00	2.038E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.038E+00
Ra-226	1.240E-10	0.000E+00	0.000E+00	0.000E+00	6.418E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.418E-07
Se-79	2.601E-04	0.000E+00	0.000E+00	0.000E+00	1.346E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.346E+00
Sn-126	2.601E-04	0.000E+00	0.000E+00	0.000E+00	1.346E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.346E+00
Sr-90	5.005E-04	0.000E+00	0.000E+00	0.000E+00	2.590E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.590E+00
Tc-99	2.601E-04	0.000E+00	0.000E+00	0.000E+00	1.346E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.346E+00
Th-229	6.013E-07	0.000E+00	0.000E+00	0.000E+00	3.112E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.112E-03
Th-230	5.735E-08	0.000E+00	0.000E+00	0.000E+00	2.968E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.968E-04
U-233	6.364E-04	0.000E+00	0.000E+00	0.000E+00	3.293E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.293E+00
U-234	6.364E-04	0.000E+00	0.000E+00	0.000E+00	3.293E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.293E+00
U-235	6.364E-04	0.000E+00	0.000E+00	0.000E+00	3.293E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.293E+00
U-238	6.364E-04	0.000E+00	0.000E+00	0.000E+00	3.293E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.293E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 24
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.221E-12	0.0000	4.510E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.160E-14	0.0000
Am-241	7.019E-10	0.0028	2.394E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.404E-10	0.0017
C-14	5.587E-20	0.0000	1.223E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.831E-18	0.0000
Co-60	7.724E-08	0.3044	1.617E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.847E-11	0.0001
Cs-137	4.905E-08	0.1933	5.592E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.663E-11	0.0004
H-3	0.000E+00	0.0000	2.837E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.590E-18	0.0000
I-129	1.443E-10	0.0006	9.218E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.599E-10	0.0038
Ni-63	0.000E+00	0.0000	3.398E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.898E-12	0.0000
Np-237	1.995E-08	0.0786	1.831E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.003E-10	0.0012
Pa-231	7.699E-13	0.0000	1.077E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.653E-13	0.0000
Pb-210	2.293E-18	0.0000	4.235E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.453E-16	0.0000
Pu-238	1.773E-12	0.0000	3.062E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.131E-10	0.0020
Pu-239	5.057E-12	0.0000	3.511E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.738E-10	0.0023
Pu-241	2.037E-13	0.0000	3.330E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.538E-12	0.0000
Ra-226	4.524E-14	0.0000	3.868E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.644E-16	0.0000
Se-79	1.095E-13	0.0000	4.950E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-11	0.0000
Sn-126	8.491E-08	0.3347	1.027E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.049E-11	0.0002
Sr-90	3.763E-10	0.0015	2.143E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.439E-10	0.0010
Tc-99	8.077E-13	0.0000	9.479E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.150E-12	0.0000
Th-229	2.885E-11	0.0001	1.451E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.339E-12	0.0000
Th-230	1.964E-15	0.0000	2.047E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.708E-14	0.0000
U-233	2.483E-11	0.0001	1.801E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.191E-10	0.0013
U-234	6.451E-12	0.0000	1.769E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.145E-10	0.0012
U-235	1.370E-08	0.0540	1.591E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-10	0.0013
U-238	2.821E-09	0.0111	1.504E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.971E-10	0.0016
Total	2.490E-07	0.9813	1.756E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-09	0.0180

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 25
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.297E-12	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-09	0.0046
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.726E-08	0.3045
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.914E-08	0.1937
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-15	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-09	0.0044
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.902E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.027E-08	0.0799
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.460E-13	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.480E-16	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.455E-10	0.0021
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-10	0.0024
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.074E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.561E-14	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-08	0.3349
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.204E-10	0.0024
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.967E-12	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.133E-11	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.109E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.619E-10	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.386E-10	0.0013
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-08	0.0553
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.234E-09	0.0127
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.537E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 26
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	6.927E-10	0.0027	2.363E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.346E-10	0.0017
C-14	5.587E-20	0.0000	1.223E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.831E-18	0.0000
Co-60	7.724E-08	0.3044	1.617E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.847E-11	0.0001
Cs-137	4.905E-08	0.1933	5.592E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.663E-11	0.0004
H-3	0.000E+00	0.0000	2.837E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.590E-18	0.0000
I-129	1.443E-10	0.0006	9.218E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.599E-10	0.0038
Ni-63	0.000E+00	0.0000	3.398E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.898E-12	0.0000
Np-237	1.995E-08	0.0786	1.831E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.003E-10	0.0012
Pu-238	1.773E-12	0.0000	3.062E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.131E-10	0.0020
Pu-239	5.057E-12	0.0000	3.511E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.738E-10	0.0023
Pu-241	9.430E-12	0.0000	6.477E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-11	0.0000
Se-79	1.095E-13	0.0000	4.950E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.247E-11	0.0000
Sn-126	8.491E-08	0.3347	1.027E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.049E-11	0.0002
Sr-90	3.763E-10	0.0015	2.143E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.439E-10	0.0010
Tc-99	8.077E-13	0.0000	9.479E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.150E-12	0.0000
U-233	5.367E-11	0.0002	1.815E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.214E-10	0.0013
U-234	6.498E-12	0.0000	1.769E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.145E-10	0.0012
U-235	1.370E-08	0.0540	1.592E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-10	0.0013
U-238	2.821E-09	0.0111	1.504E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.972E-10	0.0016
Total	2.490E-07	0.9813	1.756E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-09	0.0180

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 27
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-09	0.0045
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.726E-08	0.3045
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.914E-08	0.1937
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-15	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-09	0.0044
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.902E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.027E-08	0.0799
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.455E-10	0.0021
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.139E-10	0.0024
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.040E-11	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-08	0.3349
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.204E-10	0.0024
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.967E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.932E-10	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.387E-10	0.0013
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-08	0.0553
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.234E-09	0.0127
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.537E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 28
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.427E-07	0.000E+00	0.000E+00	0.000E+00	7.384E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.384E-04
Am-241	6.226E-04	0.000E+00	0.000E+00	0.000E+00	3.222E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.222E+00
C-14	2.980E-19	0.000E+00	0.000E+00	0.000E+00	3.957E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.957E-19
Co-60	1.226E-05	0.000E+00	0.000E+00	0.000E+00	6.345E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.345E-02
Cs-137	3.168E-04	0.000E+00	0.000E+00	0.000E+00	1.639E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.639E+00
H-3	3.213E-12	0.000E+00	0.000E+00	0.000E+00	5.079E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.079E-14
I-129	4.769E-04	0.000E+00	0.000E+00	0.000E+00	2.468E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.468E+00
Ni-63	5.080E-04	0.000E+00	0.000E+00	0.000E+00	2.629E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.629E+00
Np-237	6.370E-04	0.000E+00	0.000E+00	0.000E+00	3.296E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.296E+00
Pa-231	4.021E-07	0.000E+00	0.000E+00	0.000E+00	2.081E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.081E-03
Pb-210	2.779E-10	0.000E+00	0.000E+00	0.000E+00	1.438E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.438E-06
Pu-238	5.024E-04	0.000E+00	0.000E+00	0.000E+00	2.600E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.600E+00
Pu-239	6.362E-04	0.000E+00	0.000E+00	0.000E+00	3.292E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.292E+00
Pu-241	1.502E-04	0.000E+00	0.000E+00	0.000E+00	7.775E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.775E-01
Ra-226	1.110E-09	0.000E+00	0.000E+00	0.000E+00	5.745E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.745E-06
Se-79	4.325E-05	0.000E+00	0.000E+00	0.000E+00	2.238E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.238E-01
Sn-126	4.326E-05	0.000E+00	0.000E+00	0.000E+00	2.238E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.238E-01
Sr-90	3.083E-04	0.000E+00	0.000E+00	0.000E+00	1.595E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.595E+00
Tc-99	4.326E-05	0.000E+00	0.000E+00	0.000E+00	2.239E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.239E-01
Th-229	1.798E-06	0.000E+00	0.000E+00	0.000E+00	9.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.306E-03
Th-230	1.717E-07	0.000E+00	0.000E+00	0.000E+00	8.883E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.883E-04
U-233	6.336E-04	0.000E+00	0.000E+00	0.000E+00	3.279E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.279E+00
U-234	6.337E-04	0.000E+00	0.000E+00	0.000E+00	3.279E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.279E+00
U-235	6.336E-04	0.000E+00	0.000E+00	0.000E+00	3.279E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.279E+00
U-238	6.336E-04	0.000E+00	0.000E+00	0.000E+00	3.279E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.279E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page  29
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.461E-12	0.0001	3.125E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.961E-13	0.0000
Am-241	6.876E-10	0.0075	2.346E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.314E-10	0.0047
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.543E-09	0.0601	1.160E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-12	0.0000
Cs-137	3.076E-08	0.3334	3.507E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.061E-11	0.0007
H-3	0.000E+00	0.0000	1.681E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.498E-27	0.0000
I-129	1.189E-10	0.0013	7.594E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.909E-10	0.0086
Ni-63	0.000E+00	0.0000	2.920E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.491E-12	0.0000
Np-237	1.993E-08	0.2160	1.829E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.001E-10	0.0033
Pa-231	2.226E-12	0.0000	3.115E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.780E-13	0.0000
Pb-210	4.847E-17	0.0000	8.951E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.185E-15	0.0000
Pu-238	1.512E-12	0.0000	2.612E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.376E-10	0.0047
Pu-239	5.049E-12	0.0001	3.505E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.728E-10	0.0062
Pu-241	7.769E-14	0.0000	1.270E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.731E-12	0.0000
Ra-226	3.794E-13	0.0000	3.244E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.056E-15	0.0000
Se-79	1.820E-14	0.0000	8.233E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-12	0.0000
Sn-126	1.412E-08	0.1531	1.708E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.397E-12	0.0001
Sr-90	2.318E-10	0.0025	1.320E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-10	0.0016
Tc-99	1.343E-13	0.0000	1.577E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.565E-13	0.0000
Th-229	8.353E-11	0.0009	4.201E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.775E-12	0.0001
Th-230	5.694E-15	0.0000	5.933E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E-13	0.0000
U-233	2.472E-11	0.0003	1.793E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.177E-10	0.0034
U-234	6.423E-12	0.0001	1.761E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-10	0.0034
U-235	1.364E-08	0.1478	1.584E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.201E-10	0.0035
U-238	2.809E-09	0.0304	1.497E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.954E-10	0.0043
Total	8.798E-08	0.9536	1.702E-10	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.115E-09	0.0446

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 30
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.988E-12	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.142E-09	0.0124
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.544E-09	0.0601
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.083E-08	0.3341
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.098E-10	0.0099
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.494E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E-08	0.2195
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.735E-12	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.243E-15	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.652E-10	0.0050
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.129E-10	0.0066
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.936E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.825E-13	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.093E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.1531
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.821E-10	0.0041
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.924E-13	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.073E-11	0.0010
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.603E-10	0.0039
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.372E-10	0.0037
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.397E-08	0.1515
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-09	0.0349
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.227E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways
0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 31
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	6.703E-10	0.0073	2.286E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-10	0.0046
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.543E-09	0.0601	1.160E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-12	0.0000
Cs-137	3.076E-08	0.3334	3.507E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.061E-11	0.0007
H-3	0.000E+00	0.0000	1.681E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.498E-27	0.0000
I-129	1.189E-10	0.0013	7.594E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.909E-10	0.0086
Ni-63	0.000E+00	0.0000	2.920E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.491E-12	0.0000
Np-237	1.993E-08	0.2160	1.829E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.001E-10	0.0033
Pu-238	1.513E-12	0.0000	2.612E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.376E-10	0.0047
Pu-239	5.049E-12	0.0001	3.505E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.728E-10	0.0062
Pu-241	1.759E-11	0.0002	7.243E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-11	0.0001
Se-79	1.820E-14	0.0000	8.233E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-12	0.0000
Sn-126	1.412E-08	0.1531	1.708E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.397E-12	0.0001
Sr-90	2.318E-10	0.0025	1.320E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-10	0.0016
Tc-99	1.343E-13	0.0000	1.577E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.565E-13	0.0000
U-233	1.082E-10	0.0012	1.835E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.244E-10	0.0035
U-234	6.807E-12	0.0001	1.762E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.132E-10	0.0034
U-235	1.365E-08	0.1479	1.590E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.211E-10	0.0035
U-238	2.809E-09	0.0304	1.497E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.955E-10	0.0043
Total	8.798E-08	0.9536	1.702E-10	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.115E-09	0.0446

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 32
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.114E-09	0.0121
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.544E-09	0.0601
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.083E-08	0.3341
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.098E-10	0.0099
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.494E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E-08	0.2195
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.653E-10	0.0050
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.129E-10	0.0066
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.103E-11	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.093E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.1531
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.821E-10	0.0041
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.924E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.510E-10	0.0049
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-10	0.0037
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-08	0.1516
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-09	0.0349
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.227E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 33
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	9.163E-07	0.000E+00	0.000E+00	0.000E+00	4.741E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.741E-03
Am-241	5.588E-04	0.000E+00	0.000E+00	0.000E+00	2.892E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.892E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	1.214E-09	0.000E+00	0.000E+00	0.000E+00	6.282E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.282E-06
Cs-137	6.192E-05	0.000E+00	0.000E+00	0.000E+00	3.204E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.204E-01
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	2.421E-04	0.000E+00	0.000E+00	0.000E+00	1.253E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.253E+00
Ni-63	2.988E-04	0.000E+00	0.000E+00	0.000E+00	1.546E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.546E+00
Np-237	6.351E-04	0.000E+00	0.000E+00	0.000E+00	3.286E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.286E+00
Pa-231	1.319E-06	0.000E+00	0.000E+00	0.000E+00	6.826E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.826E-03
Pb-210	6.727E-09	0.000E+00	0.000E+00	0.000E+00	3.481E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.481E-05
Pu-238	2.879E-04	0.000E+00	0.000E+00	0.000E+00	1.490E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.490E+00
Pu-239	6.325E-04	0.000E+00	0.000E+00	0.000E+00	3.273E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.273E+00
Pu-241	5.150E-06	0.000E+00	0.000E+00	0.000E+00	2.665E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.665E-02
Ra-226	1.210E-08	0.000E+00	0.000E+00	0.000E+00	6.264E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.264E-05
Se-79	8.113E-08	0.000E+00	0.000E+00	0.000E+00	4.198E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.198E-04
Sn-126	8.116E-08	0.000E+00	0.000E+00	0.000E+00	4.200E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.200E-04
Sr-90	5.651E-05	0.000E+00	0.000E+00	0.000E+00	2.924E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.924E-01
Tc-99	8.119E-08	0.000E+00	0.000E+00	0.000E+00	4.201E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.201E-04
Th-229	5.930E-06	0.000E+00	0.000E+00	0.000E+00	3.069E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.069E-02
Th-230	5.677E-07	0.000E+00	0.000E+00	0.000E+00	2.938E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.938E-03
U-233	6.241E-04	0.000E+00	0.000E+00	0.000E+00	3.230E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E+00
U-234	6.242E-04	0.000E+00	0.000E+00	0.000E+00	3.230E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E+00
U-235	6.241E-04	0.000E+00	0.000E+00	0.000E+00	3.230E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E+00
U-238	6.241E-04	0.000E+00	0.000E+00	0.000E+00	3.230E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 34
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.316E-11	0.0011	1.963E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.117E-12	0.0001
Am-241	6.170E-10	0.0132	2.105E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.871E-10	0.0083
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.488E-13	0.0000	1.149E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-16	0.0000
Cs-137	6.013E-09	0.1288	6.855E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-11	0.0003
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.034E-11	0.0013	3.855E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.015E-10	0.0086
Ni-63	0.000E+00	0.0000	1.718E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-12	0.0000
Np-237	1.987E-08	0.4259	1.824E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.992E-10	0.0064
Pa-231	7.220E-12	0.0002	1.010E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-12	0.0000
Pb-210	1.134E-15	0.0000	2.095E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.213E-13	0.0000
Pu-238	8.665E-13	0.0000	1.497E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.508E-10	0.0054
Pu-239	5.019E-12	0.0001	3.485E-11	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.695E-10	0.0122
Pu-241	2.663E-15	0.0000	4.354E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.933E-14	0.0000
Ra-226	4.042E-12	0.0001	3.456E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.256E-14	0.0000
Se-79	3.414E-17	0.0000	1.544E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.891E-15	0.0000
Sn-126	2.649E-11	0.0006	3.205E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-14	0.0000
Sr-90	4.249E-11	0.0009	2.420E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.753E-11	0.0006
Tc-99	2.521E-16	0.0000	2.959E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-15	0.0000
Th-229	2.723E-10	0.0058	1.369E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-11	0.0005
Th-230	1.861E-14	0.0000	1.940E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.513E-13	0.0000
U-233	2.435E-11	0.0005	1.766E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.129E-10	0.0067
U-234	6.327E-12	0.0001	1.735E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.085E-10	0.0066
U-235	1.343E-08	0.2879	1.560E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.153E-10	0.0068
U-238	2.767E-09	0.0593	1.475E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.895E-10	0.0083
Total	4.321E-08	0.9259	1.562E-10	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.302E-09	0.0708

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 35
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.647E-11	0.0012
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.025E-09	0.0220
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.489E-13	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.024E-09	0.1291
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.619E-10	0.0099
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.467E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-08	0.4327
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.871E-12	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.227E-13	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.666E-10	0.0057
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-10	0.0131
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.635E-14	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.075E-12	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.927E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.651E-11	0.0006
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.004E-11	0.0015
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.862E-15	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.957E-10	0.0063
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.894E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.549E-10	0.0076
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.321E-10	0.0071
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.376E-08	0.2950
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.171E-09	0.0680
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.667E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 36
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	5.972E-10	0.0128	2.035E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.744E-10	0.0080
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.488E-13	0.0000	1.149E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-16	0.0000
Cs-137	6.013E-09	0.1288	6.855E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-11	0.0003
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.034E-11	0.0013	3.855E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.015E-10	0.0086
Ni-63	0.000E+00	0.0000	1.718E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.465E-12	0.0000
Np-237	1.987E-08	0.4259	1.824E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.993E-10	0.0064
Pu-238	8.681E-13	0.0000	1.497E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.508E-10	0.0054
Pu-239	5.021E-12	0.0001	3.485E-11	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.695E-10	0.0122
Pu-241	2.039E-11	0.0004	6.993E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.284E-11	0.0003
Se-79	3.414E-17	0.0000	1.544E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.891E-15	0.0000
Sn-126	2.649E-11	0.0006	3.205E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-14	0.0000
Sr-90	4.249E-11	0.0009	2.420E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.753E-11	0.0006
Tc-99	2.521E-16	0.0000	2.959E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-15	0.0000
U-233	2.965E-10	0.0064	1.902E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.349E-10	0.0072
U-234	1.039E-11	0.0002	1.736E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.088E-10	0.0066
U-235	1.349E-08	0.2892	1.590E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-10	0.0069
U-238	2.767E-09	0.0593	1.475E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.896E-10	0.0083
Total	4.321E-08	0.9259	1.562E-10	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.302E-09	0.0708

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 37
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.920E-10	0.0213
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.489E-13	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.024E-09	0.1291
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.619E-10	0.0099
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.467E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-08	0.4327
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.667E-10	0.0057
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-10	0.0131
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.393E-11	0.0007
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.927E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.651E-11	0.0006
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.004E-11	0.0015
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.862E-15	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.504E-10	0.0139
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.366E-10	0.0072
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-08	0.2964
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.171E-09	0.0680
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.667E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 38
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.356E-06	0.000E+00	0.000E+00	0.000E+00	1.737E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.737E-02
Am-241	4.012E-04	0.000E+00	0.000E+00	0.000E+00	2.076E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	4.398E-21	0.000E+00	0.000E+00	0.000E+00	2.276E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.276E-17
Cs-137	5.836E-07	0.000E+00	0.000E+00	0.000E+00	3.020E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.020E-03
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	3.489E-05	0.000E+00	0.000E+00	0.000E+00	1.805E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.805E-01
Ni-63	6.561E-05	0.000E+00	0.000E+00	0.000E+00	3.395E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.395E-01
Np-237	6.297E-04	0.000E+00	0.000E+00	0.000E+00	3.259E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.259E+00
Pa-231	3.782E-06	0.000E+00	0.000E+00	0.000E+00	1.957E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.957E-02
Pb-210	8.382E-08	0.000E+00	0.000E+00	0.000E+00	4.338E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.338E-04
Pu-238	5.866E-05	0.000E+00	0.000E+00	0.000E+00	3.035E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.035E-01
Pu-239	6.221E-04	0.000E+00	0.000E+00	0.000E+00	3.219E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.219E+00
Pu-241	3.358E-10	0.000E+00	0.000E+00	0.000E+00	1.738E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.738E-06
Ra-226	1.033E-07	0.000E+00	0.000E+00	0.000E+00	5.343E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.343E-04
Se-79	1.313E-15	0.000E+00	0.000E+00	0.000E+00	6.793E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.793E-12
Sn-126	1.314E-15	0.000E+00	0.000E+00	0.000E+00	6.800E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.800E-12
Sr-90	4.437E-07	0.000E+00	0.000E+00	0.000E+00	2.296E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.296E-03
Tc-99	1.316E-15	0.000E+00	0.000E+00	0.000E+00	6.808E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.808E-12
Th-229	1.725E-05	0.000E+00	0.000E+00	0.000E+00	8.924E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.924E-02
Th-230	1.666E-06	0.000E+00	0.000E+00	0.000E+00	8.619E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.619E-03
U-233	5.977E-04	0.000E+00	0.000E+00	0.000E+00	3.093E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.093E+00
U-234	5.978E-04	0.000E+00	0.000E+00	0.000E+00	3.094E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.094E+00
U-235	5.976E-04	0.000E+00	0.000E+00	0.000E+00	3.093E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.093E+00
U-238	5.976E-04	0.000E+00	0.000E+00	0.000E+00	3.093E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.093E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page  39
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.938E-10	0.0049	7.157E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E-11	0.0003
Am-241	4.430E-10	0.0112	1.511E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.780E-10	0.0070
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.988E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.755E-28	0.0000
Cs-137	5.667E-11	0.0014	6.461E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.696E-12	0.0002	5.555E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E-11	0.0015
Ni-63	0.000E+00	0.0000	3.771E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-13	0.0000
Np-237	1.971E-08	0.4985	1.808E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.967E-10	0.0075
Pa-231	2.063E-11	0.0005	2.886E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.429E-12	0.0001
Pb-210	1.401E-14	0.0000	2.587E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.499E-12	0.0000
Pu-238	1.766E-13	0.0000	3.050E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.109E-11	0.0013
Pu-239	4.937E-12	0.0001	3.428E-11	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.601E-10	0.0142
Pu-241	1.736E-19	0.0000	2.839E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.869E-18	0.0000
Ra-226	3.425E-11	0.0009	2.929E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.759E-13	0.0000
Se-79	5.524E-25	0.0000	2.498E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.295E-23	0.0000
Sn-126	4.290E-19	0.0000	5.189E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.551E-22	0.0000
Sr-90	3.336E-13	0.0000	1.900E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.162E-13	0.0000
Tc-99	4.085E-24	0.0000	4.794E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.605E-23	0.0000
Th-229	7.892E-10	0.0200	3.969E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.400E-11	0.0016
Th-230	5.443E-14	0.0000	5.672E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-12	0.0000
U-233	2.332E-11	0.0006	1.691E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.997E-10	0.0076
U-234	6.060E-12	0.0002	1.662E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.954E-10	0.0075
U-235	1.286E-08	0.3254	1.494E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-10	0.0076
U-238	2.650E-09	0.0670	1.412E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.730E-10	0.0094
Total	3.680E-08	0.9308	1.382E-10	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.597E-09	0.0657

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 40
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.058E-10	0.0052
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.361E-10	0.0186
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-24	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.679E-11	0.0014
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.656E-11	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-13	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.002E-08	0.5064
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.535E-11	0.0006
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.515E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.432E-11	0.0014
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.993E-10	0.0152
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.326E-18	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.453E-11	0.0009
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.353E-23	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.292E-19	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.499E-13	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.018E-23	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.572E-10	0.0217
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.399E-10	0.0086
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.181E-10	0.0080
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.318E-08	0.3334
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.037E-09	0.0768
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.954E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 41
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	4.298E-10	0.0109	1.461E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.687E-10	0.0068
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.988E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.755E-28	0.0000
Cs-137	5.667E-11	0.0014	6.461E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.696E-12	0.0002	5.555E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E-11	0.0015
Ni-63	0.000E+00	0.0000	3.771E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-13	0.0000
Np-237	1.971E-08	0.4984	1.811E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.971E-10	0.0075
Pu-238	1.845E-13	0.0000	3.055E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.119E-11	0.0013
Pu-239	4.941E-12	0.0001	3.428E-11	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.601E-10	0.0142
Pu-241	1.481E-11	0.0004	5.036E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.262E-12	0.0002
Se-79	5.524E-25	0.0000	2.498E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.295E-23	0.0000
Sn-126	4.290E-19	0.0000	5.189E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.551E-22	0.0000
Sr-90	3.336E-13	0.0000	1.900E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.162E-13	0.0000
Tc-99	4.085E-24	0.0000	4.794E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.605E-23	0.0000
U-233	8.120E-10	0.0205	2.086E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.632E-10	0.0092
U-234	4.036E-11	0.0010	1.666E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-10	0.0075
U-235	1.308E-08	0.3308	1.594E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.177E-10	0.0080
U-238	2.650E-09	0.0670	1.414E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.732E-10	0.0094
Total	3.680E-08	0.9308	1.382E-10	0.0035	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.597E-09	0.0657

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 42
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.131E-10	0.0180
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-24	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.679E-11	0.0014
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.656E-11	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-13	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.002E-08	0.5064
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.443E-11	0.0014
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.993E-10	0.0152
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.457E-11	0.0006
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.353E-23	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.292E-19	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.499E-13	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.018E-23	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0303
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.549E-10	0.0090
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.341E-08	0.3392
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.037E-09	0.0768
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.954E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:32  Page  43
 Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.032E-05	0.000E+00	0.000E+00	0.000E+00	5.338E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.338E-02
Am-241	1.257E-04	0.000E+00	0.000E+00	0.000E+00	6.504E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.504E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	4.745E-14	0.000E+00	0.000E+00	0.000E+00	2.455E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.455E-10
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	3.964E-08	0.000E+00	0.000E+00	0.000E+00	2.051E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.051E-04
Ni-63	3.254E-07	0.000E+00	0.000E+00	0.000E+00	1.684E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.684E-03
Np-237	6.113E-04	0.000E+00	0.000E+00	0.000E+00	3.164E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.164E+00
Pa-231	1.075E-05	0.000E+00	0.000E+00	0.000E+00	5.564E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.564E-02
Pb-210	8.997E-07	0.000E+00	0.000E+00	0.000E+00	4.656E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.656E-03
Pu-238	2.240E-07	0.000E+00	0.000E+00	0.000E+00	1.159E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.159E-03
Pu-239	5.869E-04	0.000E+00	0.000E+00	0.000E+00	3.037E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.037E+00
Pu-241	7.520E-25	0.000E+00	0.000E+00	0.000E+00	3.892E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.892E-21
Ra-226	9.551E-07	0.000E+00	0.000E+00	0.000E+00	4.942E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.942E-03
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	1.903E-14	0.000E+00	0.000E+00	0.000E+00	9.846E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.846E-11
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	5.159E-05	0.000E+00	0.000E+00	0.000E+00	2.669E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.669E-01
Th-230	5.139E-06	0.000E+00	0.000E+00	0.000E+00	2.659E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.659E-02
U-233	5.138E-04	0.000E+00	0.000E+00	0.000E+00	2.659E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.659E+00
U-234	5.137E-04	0.000E+00	0.000E+00	0.000E+00	2.658E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.658E+00
U-235	5.135E-04	0.000E+00	0.000E+00	0.000E+00	2.657E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.657E+00
U-238	5.135E-04	0.000E+00	0.000E+00	0.000E+00	2.657E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.657E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 44
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.947E-10	0.0155	2.197E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.487E-11	0.0009
Am-241	1.388E-10	0.0036	4.735E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.709E-11	0.0023
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.608E-18	0.0000	5.253E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.077E-21	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.879E-15	0.0000	6.311E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.572E-14	0.0000
Ni-63	0.000E+00	0.0000	1.870E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-15	0.0000
Np-237	1.913E-08	0.4990	1.755E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.880E-10	0.0075
Pa-231	5.859E-11	0.0015	8.196E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-11	0.0003
Pb-210	1.500E-13	0.0000	2.769E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.604E-11	0.0004
Pu-238	6.741E-16	0.0000	1.164E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.951E-13	0.0000
Pu-239	4.658E-12	0.0001	3.234E-11	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.285E-10	0.0138
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	3.161E-10	0.0082	2.703E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.546E-12	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.431E-20	0.0000	8.147E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.271E-21	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	2.358E-09	0.0615	1.186E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.912E-10	0.0050
Th-230	1.677E-13	0.0000	1.748E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.166E-12	0.0001
U-233	2.004E-11	0.0005	1.454E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.576E-10	0.0067
U-234	5.207E-12	0.0001	1.428E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.539E-10	0.0066
U-235	1.105E-08	0.2883	1.284E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.594E-10	0.0068
U-238	2.277E-09	0.0594	1.213E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.205E-10	0.0084
Total	3.596E-08	0.9379	1.235E-10	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-09	0.0588

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 45
Intrisk : Residual Dose and Risk Assessment for Construction Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.318E-10	0.0165
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.306E-10	0.0060
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.617E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.561E-14	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.597E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.944E-08	0.5070
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.198E-11	0.0019
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.622E-11	0.0004
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-13	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.655E-10	0.0147
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.187E-10	0.0083
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.358E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.561E-09	0.0668
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.509E-12	0.0001
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.922E-10	0.0076
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.733E-10	0.0071
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.133E-08	0.2954
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.609E-09	0.0681
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways
0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 46
Intrisk : Residual Dose and Risk Assessment for Construction Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CONSTRUCTION_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.372E-10	0.0036	4.580E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.423E-11	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.608E-18	0.0000	5.253E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.077E-21	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.879E-15	0.0000	6.311E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.572E-14	0.0000
Ni-63	0.000E+00	0.0000	1.870E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-15	0.0000
Np-237	1.913E-08	0.4991	1.765E-11	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.896E-10	0.0076
Pu-238	9.269E-14	0.0000	1.693E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.940E-13	0.0000
Pu-239	4.670E-12	0.0001	3.234E-11	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.285E-10	0.0138
Pu-241	4.726E-12	0.0001	1.578E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.903E-12	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.431E-20	0.0000	8.147E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.271E-21	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	2.373E-09	0.0619	2.630E-11	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.472E-10	0.0117
U-234	3.212E-10	0.0084	1.446E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.748E-10	0.0072
U-235	1.171E-08	0.3054	1.585E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.069E-10	0.0080
U-238	2.277E-09	0.0594	1.217E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.212E-10	0.0084
Total	3.596E-08	0.9379	1.235E-10	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.256E-09	0.0588

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:32 Page 47
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.261E-10	0.0059
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.617E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.561E-14	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.597E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.944E-08	0.5071
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.037E-13	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.655E-10	0.0147
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.787E-12	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.358E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.846E-09	0.0742
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.105E-10	0.0159
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.203E-08	0.3138
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.610E-09	0.0681
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D
Attachment D-3: Results of Radiological Risk Assessment for CERCLA Maintenance/ Surveillance Worker

Table D-3-1: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA A Plus B

		T=0 Year									T=1000 Year							
Nuclide		RSR (1/(pCi/g)				Risk (unitless)				%	RSR (1/(pCi/g)				Risk (unitless)			
	EPC	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0.18	8E-08	1E-12	1E-08	9E-08	1.E-08	2.E-13	3.E-09	2.E-08		2E-08	2E-13	3E-09	2E-08	3.E-09	4.E-14	5.E-10	3.E-09
C-14	3.4	6E-13	1E-11	6E-12	2E-11	2.E-12	5.E-11	2.E-11	7.E-11		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	5E-06	3E-15	3E-09	5E-06	1.E-04	8.E-14	9.E-08	1.E-04	32%	4E-16	2E-25	2E-19	4E-16	1.E-14	6.E-24	7.E-18	1.E-14
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	6E-10	2E-12	2E-08	2E-08	2.E-10	6.E-13	6.E-09	6.E-09		5E-10	2E-12	2E-08	2E-08	2.E-10	5.E-13	6.E-09	6.E-09
Pu-241	1.2	1E-09	3E-14	4E-10	1E-09	1.E-09	4.E-14	4.E-10	2.E-09		5E-10	8E-15	1E-10	6E-10	6.E-10	1.E-14	1.E-10	7.E-10
Se-79	2.4	1E-11	3E-16	4E-10	4E-10	3.E-11	6.E-16	1.E-09	1.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	1E-05	6E-15	2E-09	1E-05	3.E-04	2.E-13	6.E-08	3.E-04	68%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	4E-08	1E-14	8E-09	5E-08	7.E-07	2.E-13	1.E-07	8.E-07		1E-18	3E-25	2E-19	1E-18	2.E-17	6.E-24	4.E-18	3.E-17
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		3E-07	1E-12	2E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	3.E-09	3.E-09		4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	2.E-09	1.E-08
U-235	0.0089	2E-06	8E-13	1E-08	2E-06	1.E-08	7.E-15	1.E-10	1.E-08		1E-06	8E-13	1E-08	1E-06	1.E-08	7.E-15	9.E-11	1.E-08
U-238	0.19	3E-07	8E-13	1E-08	3E-07	6.E-08	2.E-13	3.E-09	6.E-08		3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	5.E-08
				Excess Cancer Risk		**5.E-04**	**5.E-11**	**3.E-07**	**5.E-04**				**Excess Cancer Risk**		**7.E-08**	**9.E-13**	**1.E-08**	**8.E-08**

Table D-3-2: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA C

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				%	RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	1E-11	6E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	5E-06	3E-15	3E-09	5E-06	4.E-05	2.E-14	2.E-08	4.E-05	7%	4E-16	2E-25	2E-19	4E-16	3.E-15	2.E-24	2.E-18	3.E-15
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	2E-16	1E-10	1E-10	0.E+00	8.E-16	4.E-10	4.E-10		0E+00	9E-20	5E-14	5E-14	0.E+00	4.E-19	2.E-13	2.E-13
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	4E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	1E-05	6E-15	2E-09	1E-05	5.E-04	3.E-13	9.E-08	5.E-04	93%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	4E-08	1E-14	8E-09	5E-08	1.E-07	3.E-14	2.E-08	1.E-07		1E-18	3E-25	2E-19	1E-18	4.E-18	1.E-24	7.E-19	4.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		3E-07	1E-12	2E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	7E-10	9E-13	1E-08	1E-08	0.E+00	0.E+00	0.E+00	0.E+00		4E-08	8E-13	9E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-06	8E-13	1E-08	2E-06	2.E-08	1.E-14	1.E-10	2.E-08		1E-06	8E-13	1E-08	1E-06	2.E-08	1.E-14	1.E-10	2.E-08
U-238	0.28	3E-07	8E-13	1E-08	3E-07	9.E-08	2.E-13	4.E-09	9.E-08		3E-07	6E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08
					Excess Cancer Risk	**6.E-04**	**6.E-13**	**1.E-07**	**6.E-04**					**Excess Cancer Risk**	**9.E-08**	**2.E-13**	**3.E-09**	**9.E-08**

Table D-3-3: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA E

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				%	RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	1E-11	6E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	5E-06	3E-15	3E-09	5E-06	3.E-05	1.E-14	2.E-08	3.E-05	13%	4E-16	2E-25	2E-19	4E-16	2.E-15	1.E-24	1.E-18	2.E-15
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	1E-11	3E-16	4E-10	4E-10	5.E-11	1.E-15	2.E-09	2.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	1E-05	6E-15	2E-09	1E-05	2.E-04	1.E-13	3.E-08	2.E-04	87%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	4E-08	1E-14	8E-09	5E-08	1.E-07	3.E-14	2.E-08	1.E-07		1E-18	3E-25	2E-19	1E-18	3.E-18	8.E-25	6.E-19	4.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	4.E-08		3E-07	1E-12	2E-08	3E-07	5.E-07	3.E-12	3.E-08	6.E-07
U-234	0.45	7E-10	9E-13	1E-08	1E-08	3.E-10	4.E-13	5.E-09	5.E-09		4E-08	8E-13	9E-09	5E-08	2.E-08	3.E-13	4.E-09	2.E-08
U-235	0.0012	2E-06	8E-13	1E-08	2E-06	2.E-09	1.E-15	1.E-11	2.E-09		1E-06	8E-13	1E-08	1E-06	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.28	3E-07	8E-13	1E-08	3E-07	9.E-08	2.E-13	4.E-09	9.E-08		3E-07	6E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08
				Excess Cancer Risk		**2.E-04**	**3.E-12**	**1.E-07**	**2.E-04**				**Excess Cancer Risk**		**6.E-07**	**3.E-12**	**4.E-08**	**7.E-07**

Table D-3-4: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA F Plus G

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	6E-13	1E-11	6E-12	2E-11	8.E-12	2.E-10	8.E-11	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	5E-06	3E-15	3E-09	5E-06	2.E-05	9.E-15	1.E-08	2.E-05	4E-16	2E-25	2E-19	4E-16	1.E-15	7.E-25	8.E-19	1.E-15
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	1E-11	3E-16	4E-10	4E-10	3.E-11	6.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	1E-05	6E-15	2E-09	1E-05	3.E-05	1.E-14	5.E-09	3.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	4E-08	1E-14	8E-09	5E-08	1.E-08	3.E-15	2.E-09	1.E-08	1E-18	3E-25	2E-19	1E-18	4.E-19	1.E-25	7.E-20	4.E-19
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	7E-09	1E-12	1E-08	2E-08	1.E-08	1.E-12	2.E-08	3.E-08	3E-07	1E-12	2E-08	3E-07	4.E-07	2.E-12	2.E-08	4.E-07
U-234	0.3	7E-10	9E-13	1E-08	1E-08	2.E-10	3.E-13	3.E-09	3.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	3.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.24	3E-07	8E-13	1E-08	3E-07	8.E-08	2.E-13	3.E-09	8.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	2.E-13	3.E-09	6.E-08
				Excess Cancer Risk		**4.E-05**	**2.E-10**	**4.E-08**	**4.E-05**			**Excess Cancer Risk**		**5.E-07**	**2.E-12**	**3.E-08**	**5.E-07**

Table D-3-5: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA H Plus I

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	6E-13	1E-11	6E-12	2E-11	2.E-12	5.E-11	2.E-11	7.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-06	3E-15	3E-09	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	4E-16	2E-25	2E-19	4E-16	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	8E-10	6E-13	8E-10	0.E+00	6.E-08	5.E-11	6.E-08	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	1E-11	3E-16	4E-10	4E-10	3.E-11	7.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	1E-05	6E-15	2E-09	1E-05	8.E-05	4.E-14	1.E-08	8.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	4E-08	1E-14	8E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-18	3E-25	2E-19	1E-18	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	3.E-08	3E-07	1E-12	2E-08	3E-07	4.E-07	2.E-12	2.E-08	5.E-07
U-234	0.35	7E-10	9E-13	1E-08	1E-08	3.E-10	3.E-13	4.E-09	4.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	3.E-13	3.E-09	2.E-08
U-235	0.0078	2E-06	8E-13	1E-08	2E-06	1.E-08	7.E-15	9.E-11	1.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	7.E-15	8.E-11	1.E-08
U-238	0.18	3E-07	8E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08	3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	5.E-08
				Excess Cancer Risk		**8.E-05**	**6.E-08**	**4.E-08**	**8.E-05**			**Excess Cancer Risk**		**5.E-07**	**3.E-12**	**3.E-08**	**5.E-07**

Table D-3-6: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA J

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	6E-13	1E-11	6E-12	2E-11	9.E-12	2.E-10	9.E-11	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	5E-06	3E-15	3E-09	5E-06	3.E-05	2.E-14	2.E-08	3.E-05	4E-16	2E-25	2E-19	4E-16	2.E-15	1.E-24	1.E-18	2.E-15
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-10	2E-12	2E-08	2E-08	1.E-11	1.E-13	1.E-09	1.E-09	1E-11	8E-16	9E-12	2E-11	7.E-13	6.E-17	6.E-13	1.E-12
Pu-239	0.038	6E-10	2E-12	2E-08	2E-08	2.E-11	7.E-14	7.E-10	8.E-10	5E-10	2E-12	2E-08	2E-08	2.E-11	6.E-14	7.E-10	7.E-10
Pu-241	0.14	1E-09	3E-14	4E-10	1E-09	2.E-10	5.E-15	5.E-11	2.E-10	5E-10	8E-15	1E-10	6E-10	7.E-11	1.E-15	1.E-11	9.E-11
Se-79	11.3	1E-11	3E-16	4E-10	4E-10	1.E-10	3.E-15	5.E-09	5.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	4E-08	1E-14	8E-09	5E-08	2.E-07	4.E-14	3.E-08	2.E-07	1E-18	3E-25	2E-19	1E-18	5.E-18	1.E-24	1.E-18	6.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	7E-09	1E-12	1E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-12	2E-08	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	7E-10	9E-13	1E-08	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	4E-08	8E-13	9E-09	5E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.22	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**3.E-05**	**2.E-10**	**6.E-08**	**3.E-05**			**Excess Cancer Risk**		**7.E-08**	**2.E-13**	**3.E-09**	**7.E-08**

Table D-3-7: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA L1 Plus L2

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				% Cont	RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	6E-13	1E-11	6E-12	2E-11	3.E-11	7.E-10	3.E-10	1.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	5E-06	3E-15	3E-09	5E-06	2.E-05	1.E-14	1.E-08	2.E-05	18%	4E-16	2E-25	2E-19	4E-16	1.E-15	7.E-25	8.E-19	1.E-15
H-3	4.7	0E+00	8E-10	6E-13	8E-10	0.E+00	4.E-09	3.E-12	4.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-16	1E-10	1E-10	0.E+00	7.E-14	4.E-08	4.E-08	0%	0E+00	9E-20	5E-14	5E-14	0.E+00	4.E-17	2.E-11	2.E-11
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00		2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	1E-11	3E-16	4E-10	4E-10	2.E-11	4.E-16	7.E-10	7.E-10		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	1E-05	6E-15	2E-09	1E-05	9.E-05	5.E-14	2.E-08	9.E-05	82%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	4E-08	1E-14	8E-09	5E-08	8.E-08	2.E-14	2.E-08	1.E-07	0%	1E-18	3E-25	2E-19	1E-18	2.E-18	7.E-25	5.E-19	3.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	7E-09	1E-12	1E-08	2E-08	1.E-08	1.E-12	2.E-08	3.E-08		3E-07	1E-12	2E-08	3E-07	4.E-07	2.E-12	2.E-08	4.E-07
U-234	0.25	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	3.E-09	3.E-09		4E-08	8E-13	9E-09	5E-08	9.E-09	2.E-13	2.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08		1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.23	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	8.E-08		3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	3.E-09	6.E-08
				Excess Cancer Risk		**1.E-04**	**4.E-09**	**1.E-07**	**1.E-04**				**Excess Cancer Risk**		**5.E-07**	**2.E-12**	**3.E-08**	**5.E-07**

Table D-3-8: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA P

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				%	RSR (1/(pCi/g)				Risk (unitless)			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	2.2	8E-08	1E-12	1E-08	9E-08	2.E-07	3.E-12	3.E-08	2.E-07		2E-08	2E-13	3E-09	2E-08	3.E-08	5.E-13	6.E-09	4.E-08
C-14	0	6E-13	1E-11	6E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	1E-05	1E-15	7E-10	1E-05	8.E-06	8.E-16	6.E-10	8.E-06	4%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	5E-06	3E-15	3E-09	5E-06	2.E-04	9.E-14	1.E-07	2.E-04	91%	4E-16	2E-25	2E-19	4E-16	1.E-14	7.E-24	8.E-18	1.E-14
H-3	308	0E+00	8E-10	6E-13	8E-10	0.E+00	2.E-07	2.E-10	2.E-07		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	2E-08	5E-15	3E-08	5E-08	1.E-08	4.E-15	3.E-08	4.E-08		1E-12	3E-19	2E-12	3E-12	8.E-13	2.E-19	2.E-12	2.E-12
Ni-63	85	0E+00	2E-16	1E-10	1E-10	0.E+00	2.E-14	8.E-09	8.E-09		0E+00	9E-20	5E-14	5E-14	0.E+00	8.E-18	4.E-12	4.E-12
Np-237	1.5	2E-06	1E-12	1E-08	2E-06	3.E-06	1.E-12	2.E-08	3.E-06		2E-06	9E-13	1E-08	2E-06	3.E-06	1.E-12	1.E-08	3.E-06
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00		1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	6E-10	2E-12	2E-08	2E-08	6.E-09	2.E-11	2.E-07	2.E-07		5E-10	2E-12	2E-08	2E-08	6.E-09	2.E-11	2.E-07	2.E-07
Pu-241	39.9	1E-09	3E-14	4E-10	1E-09	4.E-08	1.E-12	1.E-08	6.E-08		5E-10	8E-15	1E-10	6E-10	2.E-08	3.E-13	4.E-09	2.E-08
Se-79	4.6	1E-11	3E-16	4E-10	4E-10	6.E-11	1.E-15	2.E-09	2.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	4E-08	1E-14	8E-09	5E-08	3.E-06	9.E-13	7.E-07	4.E-06		1E-18	3E-25	2E-19	1E-18	1.E-16	3.E-23	2.E-17	1.E-16
Tc-99	24	9E-11	5E-16	2E-10	3E-10	2.E-09	1.E-14	4.E-09	7.E-09		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	3.E-08		3E-07	1E-12	2E-08	3E-07	5.E-07	3.E-12	3.E-08	5.E-07
U-234	0.72	7E-10	9E-13	1E-08	1E-08	5.E-10	7.E-13	8.E-09	8.E-09		4E-08	8E-13	9E-09	5E-08	3.E-08	5.E-13	7.E-09	3.E-08
U-235	0.025	2E-06	8E-13	1E-08	2E-06	4.E-08	2.E-14	3.E-10	4.E-08		1E-06	8E-13	1E-08	1E-06	3.E-08	2.E-14	3.E-10	3.E-08
U-238	0.52	3E-07	8E-13	1E-08	3E-07	2.E-07	4.E-13	7.E-09	2.E-07		3E-07	6E-13	1E-08	3E-07	1.E-07	3.E-13	6.E-09	1.E-07
				Excess Cancer Risk		**2.E-04**	**2.E-07**	**1.E-06**	**2.E-04**				**Excess Cancer Risk**		**4.E-06**	**2.E-11**	**3.E-07**	**4.E-06**

Table D-3-9: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA R

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	6E-13	1E-11	6E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-06	3E-15	3E-09	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	4E-16	2E-25	2E-19	4E-16	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	8E-10	6E-13	8E-10	0.E+00	2.E-09	2.E-12	2.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-06	1E-12	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	2E-06	9E-13	1E-08	2E-06	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	4E-10	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-05	6E-15	2E-09	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	4E-08	1E-14	8E-09	5E-08	2.E-08	4.E-15	3.E-09	2.E-08	1E-18	3E-25	2E-19	1E-18	5.E-19	1.E-25	9.E-20	5.E-19
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	7E-09	1E-12	1E-08	2E-08	2.E-08	2.E-12	3.E-08	4.E-08	3E-07	1E-12	2E-08	3E-07	7.E-07	3.E-12	4.E-08	7.E-07
U-234	0.22	7E-10	9E-13	1E-08	1E-08	2.E-10	2.E-13	2.E-09	3.E-09	4E-08	8E-13	9E-09	5E-08	8.E-09	2.E-13	2.E-09	1.E-08
U-235	0.01	2E-06	8E-13	1E-08	2E-06	2.E-08	8.E-15	1.E-10	2.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	8.E-15	1.E-10	1.E-08
U-238	0.22	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	6.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**1.E-07**	**2.E-09**	**3.E-08**	**2.E-07**			**Excess Cancer Risk**		**7.E-07**	**4.E-12**	**4.E-08**	**8.E-07**

Table D-3-10: Radiological Risk Assessment For Maintenance/ Surveillance Worker - EA U

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	8E-08	1E-12	1E-08	9E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-08	2E-13	3E-09	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	6E-13	1E-11	6E-12	2E-11	1.E-12	2.E-11	1.E-11	4.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-05	1E-15	7E-10	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	5E-06	3E-15	3E-09	5E-06	1.E-05	6.E-15	7.E-09	1.E-05	4E-16	2E-25	2E-19	4E-16	8.E-16	4.E-25	5.E-19	8.E-16
H-3	0	0E+00	8E-10	6E-13	8E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-08	5E-15	3E-08	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	3E-19	2E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-16	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	9E-20	5E-14	5E-14	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	2E-06	1E-12	1E-08	2E-06	1.E-06	6.E-13	6.E-09	1.E-06	2E-06	9E-13	1E-08	2E-06	1.E-06	6.E-13	6.E-09	1.E-06
Pu-238	0	2E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	1E-11	8E-16	9E-12	2E-11	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	6E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	2E-12	2E-08	2E-08	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-09	3E-14	4E-10	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-10	8E-15	1E-10	6E-10	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	1E-11	3E-16	4E-10	4E-10	4.E-11	7.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	1E-05	6E-15	2E-09	1E-05	6.E-05	3.E-14	1.E-08	6.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	4E-08	1E-14	8E-09	5E-08	2.E-07	5.E-14	3.E-08	2.E-07	1E-18	3E-25	2E-19	1E-18	5.E-18	1.E-24	1.E-18	6.E-18
Tc-99	0	9E-11	5E-16	2E-10	3E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	7E-09	1E-12	1E-08	2E-08	1.E-08	2.E-12	2.E-08	4.E-08	3E-07	1E-12	2E-08	3E-07	6.E-07	3.E-12	3.E-08	6.E-07
U-234	0.31	7E-10	9E-13	1E-08	1E-08	2.E-10	3.E-13	3.E-09	4.E-09	4E-08	8E-13	9E-09	5E-08	1.E-08	2.E-13	3.E-09	1.E-08
U-235	0.0089	2E-06	8E-13	1E-08	2E-06	1.E-08	7.E-15	1.E-10	1.E-08	1E-06	8E-13	1E-08	1E-06	1.E-08	7.E-15	9.E-11	1.E-08
U-238	0.21	3E-07	8E-13	1E-08	3E-07	7.E-08	2.E-13	3.E-09	7.E-08	3E-07	6E-13	1E-08	3E-07	5.E-08	1.E-13	2.E-09	6.E-08
				Excess Cancer Risk		**7.E-05**	**3.E-11**	**9.E-08**	**7.E-05**			**Excess Cancer Risk**		**2.E-06**	**4.E-12**	**4.E-08**	**2.E-06**

Table D-3-11: Maximum Risk Assessment Results for Maintenance/ Surveillance Worker

Exposure Pathways	Exposure Areas									
	A plus B	**C**	**E**	**F plus G**	**H plus I**	**J**	**L1 plus L2**	**P**	**R**	**U**
Carcinogenic Risk - Radiological COPCs										
External Gamma	5E-04	6.E-04	2.E-04	4.E-05	8.E-05	3.E-05	1.E-04	2.E-04	7.E-07	7.E-05
Inhalation	5E-11	6.E-13	3.E-12	2.E-10	6.E-08	2.E-10	4.E-09	2.E-07	4.E-12	3.E-11
Soil Ingestion	3E-07	1.E-07	1.E-07	4.E-08	4.E-08	6.E-08	1.E-07	1.E-06	4.E-08	9.E-08
ELCR	**5E-04**	**6.E-04**	**2.E-04**	4.E-05	8.E-05	3.E-05	**1.E-04**	**2.E-04**	8.E-07	7.E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-126	Cs-137; Sn-126	None	None	None	Cs-137; Sn-126	Cs-137	None	None

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR MAINTENANCE/ SURVEILLANCE WORKER

```
RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   1
 Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
```

Table of Contents

Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors 2
Risk Slope and ETFG for the Ground Pathway 6
Amount of Intake Quantities and Excess Cancer Risks
Time= 0.000E+00 8
Time= 1.000E+00 13
Time= 3.000E+00 18
Time= 1.000E+01 23
Time= 3.000E+01 28
Time= 1.000E+02 33
Time= 3.000E+02 38
Time= 1.000E+03 43

```
RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   2
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
```

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   3
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 4
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

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Sf-3   U-235+D                                                  9.76E-11   9.44E-11   SLPF( 26,5)
Sf-3   U-238                                                    8.66E-11   8.66E-11   SLPF( 27,5)
Sf-3   U-238+D                                                  1.21E-10   8.66E-11   SLPF( 28,5)

Sf-Rn  Radon Inhalation slope factors, 1/(pCi):
Sf-Rn  Rn-222                                                   1.80E-12   1.80E-12   SLPFRN(1,1)
Sf-Rn  Po-218                                                   3.70E-12   3.70E-12   SLPFRN(1,2)
Sf-Rn  Pb-214                                                   6.20E-12   6.20E-12   SLPFRN(1,3)
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   5
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	5.70E+02	5.70E+02	KFACTR(1,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   6
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	1.148E-01	1.148E-01	1.148E-01	1.148E-01	1.148E-01	1.148E-01	1.148E-01	1.148E-01
Ac-227	3.480E-10	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01
Am-241	2.760E-08	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01	1.156E-01
At-217	1.320E-09	1.120E-01	1.120E-01	1.120E-01	1.120E-01	1.120E-01	1.120E-01	1.120E-01	1.120E-01
At-218	3.570E-09	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01
Ba-137m	2.690E-06	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01
Bi-210	2.760E-09	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Bi-211	1.880E-07	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Bi-213	5.650E-07	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Bi-214	7.480E-06	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01	1.124E-01
C-14	7.830E-12	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01
Co-60	1.240E-05	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Cs-137	5.320E-10	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01
Fr-221	1.110E-07	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01	1.141E-01
Fr-223	1.400E-07	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01
H-3	0.000E+00	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01
I-129	6.100E-09	1.185E-01	1.185E-01	1.185E-01	1.185E-01	1.185E-01	1.185E-01	1.185E-01	1.185E-01
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01
Pa-231	1.390E-07	1.131E-01	1.131E-01	1.131E-01	1.131E-01	1.131E-01	1.131E-01	1.131E-01	1.131E-01
Pa-233	7.430E-07	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
Pa-234	8.710E-06	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01	1.123E-01
Pa-234m	6.870E-08	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Pb-209	5.370E-10	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01
Pb-210	1.410E-09	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01	1.165E-01
Pb-211	2.290E-07	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Pb-214	9.820E-07	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01	1.130E-01
Po-210	3.950E-11	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Po-211	3.580E-08	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01
Po-215	7.480E-10	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Po-218	4.260E-11	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Pu-238	7.220E-11	1.208E-01	1.208E-01	1.208E-01	1.208E-01	1.208E-01	1.208E-01	1.208E-01	1.208E-01
Pu-239	2.000E-10	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01
Pu-241	4.110E-12	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01
Ra-223	4.340E-07	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01	1.137E-01
Ra-225	5.910E-09	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01	1.164E-01
Ra-226	2.290E-08	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01
Rn-219	2.250E-07	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01	1.132E-01
Rn-222	1.740E-09	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01
Sb-126	1.280E-05	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01
Sb-126m	6.940E-06	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01	1.115E-01

Se-79	1.100E-11	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01	1.155E-01
Sn-126	9.960E-08	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01
Sr-90	4.820E-10	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01
Tc-99	8.140E-11	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01	1.151E-01
Th-227	3.780E-07	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01	1.142E-01
Th-229	2.250E-07	1.149E-01	1.149E-01	1.149E-01	1.149E-01	1.149E-01	1.149E-01	1.149E-01	1.149E-01
Th-230	8.190E-10	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01	1.150E-01

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   7
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01	1.153E-01
Th-234	1.630E-08	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01	1.152E-01
Tl-207	1.520E-08	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01
Tl-209	9.830E-06	1.128E-01	1.128E-01	1.128E-01	1.128E-01	1.128E-01	1.128E-01	1.128E-01	1.128E-01
Tl-210	0.000E+00	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01	1.240E-01
U-233	9.820E-10	1.147E-01	1.147E-01	1.147E-01	1.147E-01	1.147E-01	1.147E-01	1.147E-01	1.147E-01
U-234	2.520E-10	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01	1.161E-01
U-235	5.180E-07	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01	1.145E-01
U-237	3.760E-07	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
U-238	4.990E-11	1.204E-01	1.204E-01	1.204E-01	1.204E-01	1.204E-01	1.204E-01	1.204E-01	1.204E-01
Y-90	1.910E-08	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01	1.121E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   8
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
C-14	1.125E+01	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Co-60	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Cs-137	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
H-3	9.447E+02	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
I-129	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Ni-63	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Np-237	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Pu-239	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Pu-241	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Sn-126	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Sr-90	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Tc-99	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
U-234	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
U-235	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
U-238	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page   9
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.404E-10	0.0000	4.144E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.272E-12	0.0000
Am-241	7.921E-08	0.0027	1.261E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.506E-08	0.0005
C-14	6.316E-13	0.0000	1.379E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.272E-12	0.0000
Co-60	1.018E-05	0.3417	9.944E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.378E-10	0.0000
Cs-137	5.372E-06	0.1803	2.858E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.207E-09	0.0001
H-3	0.000E+00	0.0000	7.623E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.180E-13	0.0000
I-129	1.605E-08	0.0005	4.785E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.236E-08	0.0011
Ni-63	0.000E+00	0.0000	1.770E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.802E-11	0.0000
Np-237	2.257E-06	0.0757	9.664E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0003
Pa-231	1.036E-10	0.0000	6.761E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.738E-12	0.0000
Pb-210	8.143E-16	0.0000	7.018E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.640E-14	0.0000
Pu-238	1.977E-10	0.0000	1.594E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.734E-08	0.0006
Pu-239	5.721E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.967E-08	0.0007
Pu-241	2.221E-11	0.0000	1.695E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.500E-10	0.0000
Ra-226	9.644E-12	0.0000	3.848E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.354E-14	0.0000
Se-79	1.265E-11	0.0000	2.671E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.370E-10	0.0000
Sn-126	9.817E-06	0.3295	5.541E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.769E-09	0.0001
Sr-90	4.118E-08	0.0014	1.095E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.087E-09	0.0003
Tc-99	9.338E-11	0.0000	5.114E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.804E-10	0.0000
Th-229	3.882E-09	0.0001	9.110E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.539E-11	0.0000
Th-230	2.644E-13	0.0000	1.286E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.512E-12	0.0000
U-233	2.808E-09	0.0001	9.504E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-08	0.0004
U-234	7.295E-10	0.0000	9.336E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.078E-08	0.0004
U-235	1.549E-06	0.0520	8.396E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-08	0.0004
U-238	3.191E-07	0.0107	7.936E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-08	0.0005
Total	2.964E-05	0.9947	7.853E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.558E-07	0.0052

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  10
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.427E-08	0.0032
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.069E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-05	0.3417
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.375E-06	0.1804
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.629E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.841E-08	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.802E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0761
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.721E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.722E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.667E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.497E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.818E-06	0.3295
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.927E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.977E-09	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.777E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-08	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0524
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.327E-07	0.0112
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.980E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 11
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.812E-08	0.0026	1.244E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.485E-08	0.0005
C-14	6.316E-13	0.0000	1.379E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.272E-12	0.0000
Co-60	1.018E-05	0.3417	9.944E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.378E-10	0.0000
Cs-137	5.372E-06	0.1803	2.858E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.207E-09	0.0001
H-3	0.000E+00	0.0000	7.623E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.180E-13	0.0000
I-129	1.605E-08	0.0005	4.785E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.236E-08	0.0011
Ni-63	0.000E+00	0.0000	1.770E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.802E-11	0.0000
Np-237	2.257E-06	0.0757	9.664E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0003
Pu-238	1.978E-10	0.0000	1.594E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.734E-08	0.0006
Pu-239	5.721E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.967E-08	0.0007
Pu-241	1.117E-09	0.0000	3.438E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.581E-10	0.0000
Se-79	1.265E-11	0.0000	2.671E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.370E-10	0.0000
Sn-126	9.817E-06	0.3295	5.541E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.769E-09	0.0001
Sr-90	4.118E-08	0.0014	1.095E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.087E-09	0.0003
Tc-99	9.338E-11	0.0000	5.114E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.804E-10	0.0000
U-233	6.689E-09	0.0002	9.594E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-08	0.0004
U-234	7.394E-10	0.0000	9.337E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.078E-08	0.0004
U-235	1.549E-06	0.0520	8.407E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-08	0.0004
U-238	3.191E-07	0.0107	7.936E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-08	0.0005
Total	2.964E-05	0.9947	7.853E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.558E-07	0.0052

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 12
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.298E-08	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.069E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-05	0.3417
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.375E-06	0.1804
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.629E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.841E-08	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.802E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0761
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.475E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.497E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.818E-06	0.3295
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.927E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.772E-08	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0524
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.327E-07	0.0112
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.980E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 13
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.487E-13	0.000E+00	0.000E+00	0.000E+00	1.508E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.508E-06
Am-241	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
C-14	2.656E+00	0.000E+00	0.000E+00	0.000E+00	1.069E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.069E+00
Co-60	1.181E-06	0.000E+00	0.000E+00	0.000E+00	3.967E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.967E+00
Cs-137	1.316E-06	0.000E+00	0.000E+00	0.000E+00	4.422E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.422E+00
H-3	3.291E+02	0.000E+00	0.000E+00	0.000E+00	1.577E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.577E+00
I-129	1.334E-06	0.000E+00	0.000E+00	0.000E+00	4.482E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.482E+00
Ni-63	1.337E-06	0.000E+00	0.000E+00	0.000E+00	4.492E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.492E+00
Np-237	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Pa-231	2.849E-11	0.000E+00	0.000E+00	0.000E+00	9.574E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.574E-05
Pb-210	2.700E-17	0.000E+00	0.000E+00	0.000E+00	9.071E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.071E-11
Pu-238	1.336E-06	0.000E+00	0.000E+00	0.000E+00	4.490E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.490E+00
Pu-239	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.526E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.526E+00
Pu-241	1.284E-06	0.000E+00	0.000E+00	0.000E+00	4.313E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.313E+00
Ra-226	2.626E-15	0.000E+00	0.000E+00	0.000E+00	8.823E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.823E-09
Se-79	1.231E-06	0.000E+00	0.000E+00	0.000E+00	4.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.138E+00
Sn-126	1.231E-06	0.000E+00	0.000E+00	0.000E+00	4.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.138E+00
Sr-90	1.315E-06	0.000E+00	0.000E+00	0.000E+00	4.418E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.418E+00
Tc-99	1.231E-06	0.000E+00	0.000E+00	0.000E+00	4.138E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.138E+00
Th-229	1.272E-10	0.000E+00	0.000E+00	0.000E+00	4.273E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.273E-04
Th-230	1.212E-11	0.000E+00	0.000E+00	0.000E+00	4.074E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.074E-05
U-233	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00
U-234	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00
U-235	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00
U-238	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  14
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.685E-10	0.0000	4.627E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.770E-12	0.0000
Am-241	7.915E-08	0.0029	1.260E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.505E-08	0.0005
C-14	1.491E-13	0.0000	3.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.481E-12	0.0000
Co-60	8.924E-06	0.3237	8.717E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.467E-10	0.0000
Cs-137	5.248E-06	0.1903	2.792E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.133E-09	0.0001
H-3	0.000E+00	0.0000	2.655E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.152E-13	0.0000
I-129	1.590E-08	0.0006	4.739E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.205E-08	0.0012
Ni-63	0.000E+00	0.0000	1.757E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.728E-11	0.0000
Np-237	2.257E-06	0.0819	9.663E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0004
Pa-231	1.118E-10	0.0000	7.300E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.276E-12	0.0000
Pb-210	9.471E-16	0.0000	8.162E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.071E-14	0.0000
Pu-238	1.962E-10	0.0000	1.581E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.720E-08	0.0006
Pu-239	5.720E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.967E-08	0.0007
Pu-241	2.117E-11	0.0000	1.615E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.429E-10	0.0000
Ra-226	1.085E-11	0.0000	4.327E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.647E-14	0.0000
Se-79	1.157E-11	0.0000	2.442E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.995E-10	0.0000
Sn-126	8.974E-06	0.3255	5.066E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.617E-09	0.0001
Sr-90	4.020E-08	0.0015	1.068E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.894E-09	0.0003
Tc-99	8.537E-11	0.0000	4.675E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.649E-10	0.0000
Th-229	4.192E-09	0.0002	9.837E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-10	0.0000
Th-230	2.855E-13	0.0000	1.389E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.633E-12	0.0000
U-233	2.807E-09	0.0001	9.502E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-08	0.0004
U-234	7.294E-10	0.0000	9.334E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-08	0.0004
U-235	1.549E-06	0.0562	8.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-08	0.0004
U-238	3.190E-07	0.0116	7.934E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-08	0.0005
Total	2.741E-05	0.9944	2.780E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.548E-07	0.0056

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  15
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.732E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.420E-08	0.0034
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.886E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.924E-06	0.3237
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.251E-06	0.1905
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.657E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.794E-08	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.728E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0822
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.165E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.740E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.641E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.087E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.111E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.976E-06	0.3256
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.809E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.295E-09	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.919E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-08	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.150E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0566
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.326E-07	0.0121
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  16
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.799E-08	0.0028	1.241E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.483E-08	0.0005
C-14	1.491E-13	0.0000	3.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.481E-12	0.0000
Co-60	8.924E-06	0.3237	8.717E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.467E-10	0.0000
Cs-137	5.248E-06	0.1903	2.792E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.133E-09	0.0001
H-3	0.000E+00	0.0000	2.655E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.152E-13	0.0000
I-129	1.590E-08	0.0006	4.739E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.205E-08	0.0012
Ni-63	0.000E+00	0.0000	1.757E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.728E-11	0.0000
Np-237	2.257E-06	0.0819	9.664E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0004
Pu-238	1.962E-10	0.0000	1.581E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.720E-08	0.0006
Pu-239	5.720E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.967E-08	0.0007
Pu-241	1.187E-09	0.0000	3.471E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.645E-10	0.0000
Se-79	1.157E-11	0.0000	2.442E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.995E-10	0.0000
Sn-126	8.974E-06	0.3255	5.066E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.617E-09	0.0001
Sr-90	4.020E-08	0.0015	1.068E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.894E-09	0.0003
Tc-99	8.537E-11	0.0000	4.675E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.649E-10	0.0000
U-233	6.998E-09	0.0003	9.600E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-08	0.0004
U-234	7.405E-10	0.0000	9.335E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.078E-08	0.0004
U-235	1.549E-06	0.0562	8.406E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-08	0.0004
U-238	3.190E-07	0.0116	7.934E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.361E-08	0.0005
Total	2.741E-05	0.9944	2.780E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.548E-07	0.0056

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 17
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.282E-08	0.0034
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.886E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.924E-06	0.3237
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.251E-06	0.1905
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.657E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.794E-08	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.728E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0822
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.740E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.551E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.111E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.976E-06	0.3256
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.809E-08	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.803E-08	0.0007
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0566
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.326E-07	0.0121
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 18
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.952E-12	0.000E+00	0.000E+00	0.000E+00	1.328E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.328E-05
Am-241	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.524E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.524E+00
C-14	1.479E-01	0.000E+00	0.000E+00	0.000E+00	5.953E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.953E-02
Co-60	9.073E-07	0.000E+00	0.000E+00	0.000E+00	3.049E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.049E+00
Cs-137	1.256E-06	0.000E+00	0.000E+00	0.000E+00	4.220E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.220E+00
H-3	3.990E+01	0.000E+00	0.000E+00	0.000E+00	1.912E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.912E-01
I-129	1.308E-06	0.000E+00	0.000E+00	0.000E+00	4.396E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.396E+00
Ni-63	1.317E-06	0.000E+00	0.000E+00	0.000E+00	4.424E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.424E+00
Np-237	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00
Pa-231	8.544E-11	0.000E+00	0.000E+00	0.000E+00	2.871E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.871E-04
Pb-210	7.174E-16	0.000E+00	0.000E+00	0.000E+00	2.411E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.411E-09
Pu-238	1.315E-06	0.000E+00	0.000E+00	0.000E+00	4.419E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.419E+00
Pu-239	1.347E-06	0.000E+00	0.000E+00	0.000E+00	4.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.525E+00
Pu-241	1.166E-06	0.000E+00	0.000E+00	0.000E+00	3.917E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.917E+00
Ra-226	2.362E-14	0.000E+00	0.000E+00	0.000E+00	7.936E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.936E-08
Se-79	1.029E-06	0.000E+00	0.000E+00	0.000E+00	3.458E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.458E+00
Sn-126	1.029E-06	0.000E+00	0.000E+00	0.000E+00	3.458E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.458E+00
Sr-90	1.252E-06	0.000E+00	0.000E+00	0.000E+00	4.209E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.209E+00
Tc-99	1.029E-06	0.000E+00	0.000E+00	0.000E+00	3.458E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.458E+00
Th-229	3.814E-10	0.000E+00	0.000E+00	0.000E+00	1.282E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.282E-03
Th-230	3.636E-11	0.000E+00	0.000E+00	0.000E+00	1.222E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.222E-04
U-233	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.523E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.523E+00
U-234	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.523E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.523E+00
U-235	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.523E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.523E+00
U-238	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.523E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.523E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  19
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.300E-10	0.0000	5.688E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.864E-12	0.0000
Am-241	7.902E-08	0.0033	1.258E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.502E-08	0.0006
C-14	8.295E-15	0.0000	1.811E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.239E-14	0.0000
Co-60	6.857E-06	0.2883	6.698E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.970E-10	0.0000
Cs-137	5.009E-06	0.2106	2.665E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.990E-09	0.0001
H-3	0.000E+00	0.0000	3.216E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.608E-14	0.0000
I-129	1.559E-08	0.0007	4.648E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.143E-08	0.0013
Ni-63	0.000E+00	0.0000	1.730E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.582E-11	0.0000
Np-237	2.257E-06	0.0949	9.663E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-08	0.0004
Pa-231	1.283E-10	0.0000	8.379E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.351E-12	0.0000
Pb-210	1.259E-15	0.0000	1.085E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.082E-14	0.0000
Pu-238	1.931E-10	0.0000	1.556E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.693E-08	0.0007
Pu-239	5.719E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.966E-08	0.0008
Pu-241	1.922E-11	0.0000	1.467E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-10	0.0000
Ra-226	1.352E-11	0.0000	5.396E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.301E-14	0.0000
Se-79	9.669E-12	0.0000	2.041E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.339E-10	0.0000
Sn-126	7.501E-06	0.3153	4.234E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-09	0.0001
Sr-90	3.829E-08	0.0016	1.018E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.520E-09	0.0003
Tc-99	7.135E-11	0.0000	3.908E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.378E-10	0.0000
Th-229	4.812E-09	0.0002	1.129E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-10	0.0000
Th-230	3.278E-13	0.0000	1.594E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.875E-12	0.0000
U-233	2.806E-09	0.0001	9.498E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-08	0.0005
U-234	7.291E-10	0.0000	9.330E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-08	0.0005
U-235	1.548E-06	0.0651	8.391E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-08	0.0005
U-238	3.189E-07	0.0134	7.931E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.360E-08	0.0006
Total	2.363E-05	0.9936	4.154E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-07	0.0064

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  20
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.359E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.405E-08	0.0040
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.718E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.858E-06	0.2883
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.012E-06	0.2107
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.219E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.702E-08	0.0020
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.582E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0953
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.367E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.208E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.713E-08	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0009
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.490E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.436E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.502E-06	0.3154
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.581E-08	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.092E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.930E-09	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.203E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.373E-08	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.150E-08	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.559E-06	0.0655
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.325E-07	0.0140
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.379E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 21
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.774E-08	0.0033	1.237E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.478E-08	0.0006
C-14	8.295E-15	0.0000	1.811E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.239E-14	0.0000
Co-60	6.857E-06	0.2883	6.698E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.970E-10	0.0000
Cs-137	5.009E-06	0.2106	2.665E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.990E-09	0.0001
H-3	0.000E+00	0.0000	3.216E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.608E-14	0.0000
I-129	1.559E-08	0.0007	4.648E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.143E-08	0.0013
Ni-63	0.000E+00	0.0000	1.730E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.582E-11	0.0000
Np-237	2.257E-06	0.0949	9.663E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-08	0.0004
Pu-238	1.931E-10	0.0000	1.556E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.693E-08	0.0007
Pu-239	5.719E-10	0.0000	1.853E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.966E-08	0.0008
Pu-241	1.316E-09	0.0001	3.531E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.763E-10	0.0000
Se-79	9.669E-12	0.0000	2.041E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.339E-10	0.0000
Sn-126	7.501E-06	0.3153	4.234E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.351E-09	0.0001
Sr-90	3.829E-08	0.0016	1.018E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.520E-09	0.0003
Tc-99	7.135E-11	0.0000	3.908E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.378E-10	0.0000
U-233	7.617E-09	0.0003	9.610E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-08	0.0005
U-234	7.429E-10	0.0000	9.331E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-08	0.0005
U-235	1.549E-06	0.0651	8.405E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-08	0.0005
U-238	3.189E-07	0.0134	7.931E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.360E-08	0.0006
Total	2.363E-05	0.9936	4.154E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-07	0.0064

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 22
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.252E-08	0.0039
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.718E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.858E-06	0.2883
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.012E-06	0.2107
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.219E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.702E-08	0.0020
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.582E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.267E-06	0.0953
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.713E-08	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E-08	0.0009
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.692E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.436E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.502E-06	0.3154
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.581E-08	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.092E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.866E-08	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-08	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-06	0.0656
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.325E-07	0.0140
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.379E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  23
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.078E-11	0.000E+00	0.000E+00	0.000E+00	1.370E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.370E-04
Am-241	1.342E-06	0.000E+00	0.000E+00	0.000E+00	4.509E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.509E+00
C-14	5.907E-06	0.000E+00	0.000E+00	0.000E+00	2.378E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.378E-06
Co-60	3.608E-07	0.000E+00	0.000E+00	0.000E+00	1.212E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.212E+00
Cs-137	1.067E-06	0.000E+00	0.000E+00	0.000E+00	3.585E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.585E+00
H-3	2.445E-02	0.000E+00	0.000E+00	0.000E+00	1.172E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.172E-04
I-129	1.223E-06	0.000E+00	0.000E+00	0.000E+00	4.108E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.108E+00
Ni-63	1.249E-06	0.000E+00	0.000E+00	0.000E+00	4.196E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.196E+00
Np-237	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.524E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.524E+00
Pa-231	2.843E-10	0.000E+00	0.000E+00	0.000E+00	9.555E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.555E-04
Pb-210	2.516E-14	0.000E+00	0.000E+00	0.000E+00	8.456E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.456E-08
Pu-238	1.244E-06	0.000E+00	0.000E+00	0.000E+00	4.180E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.180E+00
Pu-239	1.346E-06	0.000E+00	0.000E+00	0.000E+00	4.522E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.522E+00
Pu-241	8.319E-07	0.000E+00	0.000E+00	0.000E+00	2.795E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.795E+00
Ra-226	2.619E-13	0.000E+00	0.000E+00	0.000E+00	8.801E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.801E-07
Se-79	5.493E-07	0.000E+00	0.000E+00	0.000E+00	1.846E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.846E+00
Sn-126	5.493E-07	0.000E+00	0.000E+00	0.000E+00	1.846E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.846E+00
Sr-90	1.057E-06	0.000E+00	0.000E+00	0.000E+00	3.552E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.552E+00
Tc-99	5.493E-07	0.000E+00	0.000E+00	0.000E+00	1.846E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.846E+00
Th-229	1.270E-09	0.000E+00	0.000E+00	0.000E+00	4.267E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.267E-03
Th-230	1.211E-10	0.000E+00	0.000E+00	0.000E+00	4.070E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.070E-04
U-233	1.344E-06	0.000E+00	0.000E+00	0.000E+00	4.516E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.516E+00
U-234	1.344E-06	0.000E+00	0.000E+00	0.000E+00	4.516E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.516E+00
U-235	1.344E-06	0.000E+00	0.000E+00	0.000E+00	4.516E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.516E+00
U-238	1.344E-06	0.000E+00	0.000E+00	0.000E+00	4.516E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.516E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  24
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.971E-10	0.0000	1.029E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-11	0.0000
Am-241	7.849E-08	0.0051	1.250E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.492E-08	0.0010
C-14	3.305E-19	0.0000	7.217E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.282E-18	0.0000
Co-60	2.727E-06	0.1772	2.664E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.976E-10	0.0000
Cs-137	4.254E-06	0.2764	2.263E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-09	0.0002
H-3	0.000E+00	0.0000	1.966E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-17	0.0000
I-129	1.457E-08	0.0009	4.343E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-08	0.0019
Ni-63	0.000E+00	0.0000	1.641E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.087E-11	0.0000
Np-237	2.256E-06	0.1466	9.660E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-08	0.0007
Pa-231	1.861E-10	0.0000	1.215E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.211E-11	0.0000
Pb-210	2.932E-15	0.0000	2.527E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.507E-14	0.0000
Pu-238	1.826E-10	0.0000	1.472E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.602E-08	0.0010
Pu-239	5.716E-10	0.0000	1.852E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-08	0.0013
Pu-241	1.372E-11	0.0000	1.047E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.262E-11	0.0000
Ra-226	2.579E-11	0.0000	1.029E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.295E-14	0.0000
Se-79	5.161E-12	0.0000	1.089E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.782E-10	0.0000
Sn-126	4.003E-06	0.2601	2.260E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.213E-10	0.0000
Sr-90	3.232E-08	0.0021	8.590E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.347E-09	0.0004
Tc-99	3.808E-11	0.0000	2.086E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.358E-11	0.0000
Th-229	6.978E-09	0.0005	1.638E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.715E-10	0.0000
Th-230	4.755E-13	0.0000	2.312E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.720E-12	0.0000
U-233	2.802E-09	0.0002	9.483E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.091E-08	0.0007
U-234	7.280E-10	0.0000	9.316E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E-08	0.0007
U-235	1.546E-06	0.1004	8.378E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-08	0.0007
U-238	3.184E-07	0.0207	7.919E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.358E-08	0.0009
Total	1.524E-05	0.9905	9.116E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.469E-07	0.0095

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 25
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.077E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.342E-08	0.0061
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.083E-17	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.727E-06	0.1772
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.257E-06	0.2766
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.968E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.394E-08	0.0029
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.087E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.266E-06	0.1473
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.982E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.800E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.620E-08	0.0011
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.022E-08	0.0013
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.063E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.585E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.834E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.004E-06	0.2602
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.867E-08	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-10	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.150E-09	0.0005
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.195E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-08	0.0009
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.148E-08	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-06	0.1012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.320E-07	0.0216
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.539E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 26
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.685E-08	0.0050	1.223E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.461E-08	0.0009
C-14	3.305E-19	0.0000	7.217E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.282E-18	0.0000
Co-60	2.727E-06	0.1772	2.664E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.976E-10	0.0000
Cs-137	4.254E-06	0.2764	2.263E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-09	0.0002
H-3	0.000E+00	0.0000	1.966E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-17	0.0000
I-129	1.457E-08	0.0009	4.343E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-08	0.0019
Ni-63	0.000E+00	0.0000	1.641E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.087E-11	0.0000
Np-237	2.256E-06	0.1466	9.661E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-08	0.0007
Pu-238	1.827E-10	0.0000	1.472E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.602E-08	0.0010
Pu-239	5.716E-10	0.0000	1.852E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-08	0.0013
Pu-241	1.675E-09	0.0001	3.692E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.085E-10	0.0000
Se-79	5.161E-12	0.0000	1.089E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.782E-10	0.0000
Sn-126	4.003E-06	0.2601	2.260E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.213E-10	0.0000
Sr-90	3.232E-08	0.0021	8.590E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.347E-09	0.0004
Tc-99	3.808E-11	0.0000	2.086E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.358E-11	0.0000
U-233	9.779E-09	0.0006	9.646E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.108E-08	0.0007
U-234	7.542E-10	0.0000	9.317E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.076E-08	0.0007
U-235	1.547E-06	0.1005	8.400E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-08	0.0007
U-238	3.184E-07	0.0207	7.919E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.358E-08	0.0009
Total	1.524E-05	0.9905	9.116E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.469E-07	0.0095

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 27
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.145E-08	0.0059
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.083E-17	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.727E-06	0.1772
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.257E-06	0.2766
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.968E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.394E-08	0.0029
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.087E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.266E-06	0.1473
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.620E-08	0.0011
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.022E-08	0.0013
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.084E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.834E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.004E-06	0.2602
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.867E-08	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.086E-08	0.0014
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.151E-08	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.558E-06	0.1012
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.320E-07	0.0216
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.539E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  28
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.014E-10	0.000E+00	0.000E+00	0.000E+00	1.013E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.013E-03
Am-241	1.315E-06	0.000E+00	0.000E+00	0.000E+00	4.418E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.418E+00
C-14	1.348E-18	0.000E+00	0.000E+00	0.000E+00	5.427E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.427E-19
Co-60	2.589E-08	0.000E+00	0.000E+00	0.000E+00	8.701E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.701E-02
Cs-137	6.691E-07	0.000E+00	0.000E+00	0.000E+00	2.248E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.248E+00
H-3	1.454E-11	0.000E+00	0.000E+00	0.000E+00	6.966E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.966E-14
I-129	1.007E-06	0.000E+00	0.000E+00	0.000E+00	3.385E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.385E+00
Ni-63	1.073E-06	0.000E+00	0.000E+00	0.000E+00	3.605E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.605E+00
Np-237	1.345E-06	0.000E+00	0.000E+00	0.000E+00	4.520E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.520E+00
Pa-231	8.492E-10	0.000E+00	0.000E+00	0.000E+00	2.853E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.853E-03
Pb-210	5.869E-13	0.000E+00	0.000E+00	0.000E+00	1.972E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.972E-06
Pu-238	1.061E-06	0.000E+00	0.000E+00	0.000E+00	3.565E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.565E+00
Pu-239	1.344E-06	0.000E+00	0.000E+00	0.000E+00	4.515E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.515E+00
Pu-241	3.173E-07	0.000E+00	0.000E+00	0.000E+00	1.066E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.066E+00
Ra-226	2.345E-12	0.000E+00	0.000E+00	0.000E+00	7.879E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.879E-06
Se-79	9.135E-08	0.000E+00	0.000E+00	0.000E+00	3.069E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.069E-01
Sn-126	9.136E-08	0.000E+00	0.000E+00	0.000E+00	3.070E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.070E-01
Sr-90	6.510E-07	0.000E+00	0.000E+00	0.000E+00	2.188E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.188E+00
Tc-99	9.137E-08	0.000E+00	0.000E+00	0.000E+00	3.070E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.070E-01
Th-229	3.798E-09	0.000E+00	0.000E+00	0.000E+00	1.276E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.276E-02
Th-230	3.625E-10	0.000E+00	0.000E+00	0.000E+00	1.218E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.218E-03
U-233	1.338E-06	0.000E+00	0.000E+00	0.000E+00	4.497E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.497E+00
U-234	1.338E-06	0.000E+00	0.000E+00	0.000E+00	4.497E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.497E+00
U-235	1.338E-06	0.000E+00	0.000E+00	0.000E+00	4.497E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.497E+00
U-238	1.338E-06	0.000E+00	0.000E+00	0.000E+00	4.497E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.497E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  29
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.686E-09	0.0002	2.905E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.995E-11	0.0000
Am-241	7.651E-08	0.0097	1.218E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.455E-08	0.0018
C-14	0.000E+00	0.0000	9.722E-31	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-32	0.0000
Co-60	1.957E-07	0.0248	1.912E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-11	0.0000
Cs-137	2.668E-06	0.3377	1.420E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-09	0.0002
H-3	0.000E+00	0.0000	1.160E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.404E-27	0.0000
I-129	1.200E-08	0.0015	3.578E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E-08	0.0031
Ni-63	0.000E+00	0.0000	1.410E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.808E-11	0.0000
Np-237	2.254E-06	0.2852	9.652E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-08	0.0013
Pa-231	3.499E-10	0.0000	2.285E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.277E-11	0.0000
Pb-210	1.454E-14	0.0000	1.253E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.714E-13	0.0000
Pu-238	1.558E-10	0.0000	1.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-08	0.0017
Pu-239	5.706E-10	0.0001	1.849E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.962E-08	0.0025
Pu-241	5.233E-12	0.0000	3.993E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-11	0.0000
Ra-226	8.542E-11	0.0000	3.408E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.085E-13	0.0000
Se-79	8.582E-13	0.0000	1.811E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-11	0.0000
Sn-126	6.658E-07	0.0843	3.758E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-10	0.0000
Sr-90	1.990E-08	0.0025	5.290E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.909E-09	0.0005
Tc-99	6.334E-12	0.0000	3.469E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.224E-11	0.0000
Th-229	1.314E-08	0.0017	3.084E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.230E-10	0.0000
Th-230	8.963E-13	0.0000	4.359E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.126E-12	0.0000
U-233	2.789E-09	0.0004	9.442E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.086E-08	0.0014
U-234	7.249E-10	0.0001	9.276E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-08	0.0014
U-235	1.539E-06	0.1948	8.342E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-08	0.0014
U-238	3.170E-07	0.0401	7.884E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-08	0.0017
Total	7.768E-06	0.9830	8.833E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-07	0.0170

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 30
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.716E-09	0.0002
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.106E-08	0.0115
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-30	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.957E-07	0.0248
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.670E-06	0.3379
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-23	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.620E-08	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.808E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.264E-06	0.2865
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.727E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.860E-13	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-08	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-08	0.0026
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.056E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.563E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.050E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.659E-07	0.0843
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.381E-08	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.347E-08	0.0017
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.023E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.365E-08	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-08	0.0014
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-06	0.1961
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.305E-07	0.0418
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.903E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 31
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.435E-08	0.0094	1.183E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.0018
C-14	0.000E+00	0.0000	9.722E-31	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.533E-32	0.0000
Co-60	1.957E-07	0.0248	1.912E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.418E-11	0.0000
Cs-137	2.668E-06	0.3377	1.420E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-09	0.0002
H-3	0.000E+00	0.0000	1.160E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.404E-27	0.0000
I-129	1.200E-08	0.0015	3.578E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E-08	0.0031
Ni-63	0.000E+00	0.0000	1.410E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.808E-11	0.0000
Np-237	2.254E-06	0.2852	9.653E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-08	0.0013
Pu-238	1.558E-10	0.0000	1.256E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-08	0.0017
Pu-239	5.707E-10	0.0001	1.849E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.962E-08	0.0025
Pu-241	2.191E-09	0.0003	3.878E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.508E-10	0.0001
Se-79	8.582E-13	0.0000	1.811E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.964E-11	0.0000
Sn-126	6.658E-07	0.0843	3.758E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-10	0.0000
Sr-90	1.990E-08	0.0025	5.290E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.909E-09	0.0005
Tc-99	6.334E-12	0.0000	3.469E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.224E-11	0.0000
U-233	1.593E-08	0.0020	9.749E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.118E-08	0.0014
U-234	8.110E-10	0.0001	9.279E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-08	0.0014
U-235	1.541E-06	0.1950	8.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.100E-08	0.0014
U-238	3.170E-07	0.0401	7.885E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-08	0.0017
Total	7.768E-06	0.9830	8.833E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-07	0.0170

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 32
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.849E-08	0.0112
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-30	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.957E-07	0.0248
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.670E-06	0.3379
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-23	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.620E-08	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.808E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.264E-06	0.2865
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-08	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-08	0.0026
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.642E-09	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.050E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.659E-07	0.0843
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.381E-08	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.857E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.712E-08	0.0034
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0015
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.552E-06	0.1964
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.305E-07	0.0418
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.903E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  33
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.935E-09	0.000E+00	0.000E+00	0.000E+00	6.502E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.502E-03
Am-241	1.180E-06	0.000E+00	0.000E+00	0.000E+00	3.965E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.965E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	2.564E-12	0.000E+00	0.000E+00	0.000E+00	8.615E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.615E-06
Cs-137	1.308E-07	0.000E+00	0.000E+00	0.000E+00	4.394E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.394E-01
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	5.113E-07	0.000E+00	0.000E+00	0.000E+00	1.718E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.718E+00
Ni-63	6.311E-07	0.000E+00	0.000E+00	0.000E+00	2.121E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.121E+00
Np-237	1.341E-06	0.000E+00	0.000E+00	0.000E+00	4.507E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.507E+00
Pa-231	2.786E-09	0.000E+00	0.000E+00	0.000E+00	9.361E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.361E-03
Pb-210	1.421E-11	0.000E+00	0.000E+00	0.000E+00	4.774E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.774E-05
Pu-238	6.080E-07	0.000E+00	0.000E+00	0.000E+00	2.043E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.043E+00
Pu-239	1.336E-06	0.000E+00	0.000E+00	0.000E+00	4.489E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.489E+00
Pu-241	1.088E-08	0.000E+00	0.000E+00	0.000E+00	3.655E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.655E-02
Ra-226	2.556E-11	0.000E+00	0.000E+00	0.000E+00	8.590E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.590E-05
Se-79	1.713E-10	0.000E+00	0.000E+00	0.000E+00	5.757E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.757E-04
Sn-126	1.714E-10	0.000E+00	0.000E+00	0.000E+00	5.759E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.759E-04
Sr-90	1.193E-07	0.000E+00	0.000E+00	0.000E+00	4.010E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.010E-01
Tc-99	1.715E-10	0.000E+00	0.000E+00	0.000E+00	5.761E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.761E-04
Th-229	1.252E-08	0.000E+00	0.000E+00	0.000E+00	4.208E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.208E-02
Th-230	1.199E-09	0.000E+00	0.000E+00	0.000E+00	4.029E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.029E-03
U-233	1.318E-06	0.000E+00	0.000E+00	0.000E+00	4.429E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.429E+00
U-234	1.318E-06	0.000E+00	0.000E+00	0.000E+00	4.430E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.430E+00
U-235	1.318E-06	0.000E+00	0.000E+00	0.000E+00	4.429E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.429E+00
U-238	1.318E-06	0.000E+00	0.000E+00	0.000E+00	4.429E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.429E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 34
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.985E-09	0.0014	1.204E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.241E-10	0.0000
Am-241	6.845E-08	0.0142	1.090E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.301E-08	0.0027
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.938E-11	0.0000	1.893E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.405E-15	0.0000
Cs-137	5.215E-07	0.1079	2.775E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.113E-10	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.093E-09	0.0013	1.816E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.228E-08	0.0025
Ni-63	0.000E+00	0.0000	8.293E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-11	0.0000
Np-237	2.247E-06	0.4649	9.623E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.025E-08	0.0021
Pa-231	9.118E-10	0.0002	5.953E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.933E-11	0.0000
Pb-210	1.703E-13	0.0000	1.468E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.523E-12	0.0000
Pu-238	8.926E-11	0.0000	7.195E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.828E-09	0.0016
Pu-239	5.673E-10	0.0001	1.838E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.950E-08	0.0040
Pu-241	1.794E-13	0.0000	1.369E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.211E-12	0.0000
Ra-226	5.734E-10	0.0001	2.288E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-12	0.0000
Se-79	1.610E-15	0.0000	3.398E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.559E-14	0.0000
Sn-126	1.249E-09	0.0003	7.051E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.251E-13	0.0000
Sr-90	3.649E-09	0.0008	9.698E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.166E-10	0.0001
Tc-99	1.189E-14	0.0000	6.510E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.297E-14	0.0000
Th-229	3.442E-08	0.0071	8.077E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.458E-10	0.0002
Th-230	2.354E-12	0.0000	1.145E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.347E-11	0.0000
U-233	2.747E-09	0.0006	9.300E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-08	0.0022
U-234	7.140E-10	0.0001	9.138E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-08	0.0022
U-235	1.516E-06	0.3136	8.216E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.078E-08	0.0022
U-238	3.122E-07	0.0646	7.766E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-08	0.0028
Total	4.724E-06	0.9772	8.155E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-07	0.0228

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  35
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.109E-09	0.0015
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.146E-08	0.0169
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.218E-07	0.1079
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.838E-08	0.0038
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.258E-06	0.4671
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.712E-10	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.693E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.918E-09	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.007E-08	0.0042
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.390E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.748E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-09	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.366E-09	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.485E-14	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.526E-08	0.0073
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.582E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.345E-08	0.0028
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.126E-08	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-06	0.3158
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.255E-07	0.0673
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.834E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 36
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	6.625E-08	0.0137	1.054E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.258E-08	0.0026
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.938E-11	0.0000	1.893E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.405E-15	0.0000
Cs-137	5.215E-07	0.1079	2.775E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.113E-10	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.093E-09	0.0013	1.816E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.228E-08	0.0025
Ni-63	0.000E+00	0.0000	8.293E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-11	0.0000
Np-237	2.247E-06	0.4649	9.628E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-08	0.0021
Pu-238	8.946E-11	0.0000	7.197E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.830E-09	0.0016
Pu-239	5.675E-10	0.0001	1.838E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.950E-08	0.0040
Pu-241	2.270E-09	0.0005	3.624E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.324E-10	0.0001
Se-79	1.610E-15	0.0000	3.398E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.559E-14	0.0000
Sn-126	1.249E-09	0.0003	7.051E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.251E-13	0.0000
Sr-90	3.649E-09	0.0008	9.698E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.166E-10	0.0001
Tc-99	1.189E-14	0.0000	6.510E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.297E-14	0.0000
U-233	3.715E-08	0.0077	1.010E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-08	0.0024
U-234	1.290E-09	0.0003	9.145E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.056E-08	0.0022
U-235	1.524E-06	0.3152	8.396E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-08	0.0023
U-238	3.122E-07	0.0646	7.769E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-08	0.0028
Total	4.724E-06	0.9772	8.155E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-07	0.0228

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 37
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.884E-08	0.0163
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.938E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.218E-07	0.1079
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.838E-08	0.0038
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.593E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.258E-06	0.4670
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.920E-09	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.007E-08	0.0042
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.703E-09	0.0006
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-09	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.366E-09	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.485E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.870E-08	0.0101
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.185E-08	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-06	0.3175
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.256E-07	0.0673
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.834E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 38
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	7.089E-09	0.000E+00	0.000E+00	0.000E+00	2.382E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.382E-02
Am-241	8.473E-07	0.000E+00	0.000E+00	0.000E+00	2.847E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.847E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	9.288E-24	0.000E+00	0.000E+00	0.000E+00	3.121E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.121E-17
Cs-137	1.233E-09	0.000E+00	0.000E+00	0.000E+00	4.142E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.142E-03
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	7.368E-08	0.000E+00	0.000E+00	0.000E+00	2.476E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.476E-01
Ni-63	1.386E-07	0.000E+00	0.000E+00	0.000E+00	4.656E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.656E-01
Np-237	1.330E-06	0.000E+00	0.000E+00	0.000E+00	4.469E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.469E+00
Pa-231	7.986E-09	0.000E+00	0.000E+00	0.000E+00	2.684E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.684E-02
Pb-210	1.770E-10	0.000E+00	0.000E+00	0.000E+00	5.949E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.949E-04
Pu-238	1.239E-07	0.000E+00	0.000E+00	0.000E+00	4.163E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.163E-01
Pu-239	1.314E-06	0.000E+00	0.000E+00	0.000E+00	4.415E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.415E+00
Pu-241	7.093E-13	0.000E+00	0.000E+00	0.000E+00	2.383E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.383E-06
Ra-226	2.181E-10	0.000E+00	0.000E+00	0.000E+00	7.328E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.328E-04
Se-79	2.772E-18	0.000E+00	0.000E+00	0.000E+00	9.315E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.315E-12
Sn-126	2.775E-18	0.000E+00	0.000E+00	0.000E+00	9.326E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.326E-12
Sr-90	9.370E-10	0.000E+00	0.000E+00	0.000E+00	3.149E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.149E-03
Tc-99	2.778E-18	0.000E+00	0.000E+00	0.000E+00	9.336E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.336E-12
Th-229	3.642E-08	0.000E+00	0.000E+00	0.000E+00	1.224E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.224E-01
Th-230	3.518E-09	0.000E+00	0.000E+00	0.000E+00	1.182E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.182E-02
U-233	1.262E-06	0.000E+00	0.000E+00	0.000E+00	4.241E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.241E+00
U-234	1.263E-06	0.000E+00	0.000E+00	0.000E+00	4.243E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.243E+00
U-235	1.262E-06	0.000E+00	0.000E+00	0.000E+00	4.241E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.241E+00
U-238	1.262E-06	0.000E+00	0.000E+00	0.000E+00	4.241E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.241E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  39
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.284E-08	0.0054	3.936E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.057E-10	0.0001
Am-241	4.914E-08	0.0116	7.823E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.343E-09	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	7.021E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.089E-27	0.0000
Cs-137	4.916E-09	0.0012	2.615E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.934E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.780E-10	0.0002	2.618E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.770E-09	0.0004
Ni-63	0.000E+00	0.0000	1.821E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-11	0.0000
Np-237	2.229E-06	0.5245	9.542E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-08	0.0024
Pa-231	2.421E-09	0.0006	1.580E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-10	0.0000
Pb-210	1.723E-12	0.0000	1.485E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.587E-11	0.0000
Pu-238	1.819E-11	0.0000	1.466E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-09	0.0004
Pu-239	5.580E-10	0.0001	1.808E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.918E-08	0.0045
Pu-241	1.170E-17	0.0000	8.925E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.897E-17	0.0000
Ra-226	4.180E-09	0.0010	1.668E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-11	0.0000
Se-79	2.605E-23	0.0000	5.497E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.995E-22	0.0000
Sn-126	2.023E-17	0.0000	1.142E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.645E-21	0.0000
Sr-90	2.865E-11	0.0000	7.615E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.626E-12	0.0000
Tc-99	1.926E-22	0.0000	1.055E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.722E-22	0.0000
Th-229	9.268E-08	0.0218	2.175E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.278E-09	0.0005
Th-230	6.395E-12	0.0000	3.110E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.658E-11	0.0000
U-233	2.631E-09	0.0006	8.906E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.025E-08	0.0024
U-234	6.838E-10	0.0002	8.751E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.010E-08	0.0024
U-235	1.452E-06	0.3417	7.868E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.032E-08	0.0024
U-238	2.990E-07	0.0704	7.436E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.275E-08	0.0030
Total	4.160E-06	0.9792	7.263E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.845E-08	0.0208

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 40
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.324E-08	0.0055
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.848E-08	0.0138
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.022E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.919E-09	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.648E-09	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.239E-06	0.5269
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.578E-09	0.0006
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.760E-11	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.974E-08	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.067E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.190E-09	0.0010
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.255E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-17	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.428E-11	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.648E-22	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.496E-08	0.0224
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.298E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.288E-08	0.0030
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-08	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.462E-06	0.3441
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.117E-07	0.0734
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.249E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 41
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	4.768E-08	0.0112	7.563E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.032E-09	0.0021
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	7.021E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.089E-27	0.0000
Cs-137	4.916E-09	0.0012	2.615E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.934E-12	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	8.780E-10	0.0002	2.618E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.770E-09	0.0004
Ni-63	0.000E+00	0.0000	1.821E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-11	0.0000
Np-237	2.228E-06	0.5245	9.555E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-08	0.0024
Pu-238	1.916E-11	0.0000	1.469E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.598E-09	0.0004
Pu-239	5.584E-10	0.0001	1.808E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.918E-08	0.0045
Pu-241	1.643E-09	0.0004	2.607E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.113E-10	0.0001
Se-79	2.605E-23	0.0000	5.497E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.995E-22	0.0000
Sn-126	2.023E-17	0.0000	1.142E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.645E-21	0.0000
Sr-90	2.865E-11	0.0000	7.615E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.626E-12	0.0000
Tc-99	1.926E-22	0.0000	1.055E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.722E-22	0.0000
U-233	9.524E-08	0.0224	1.107E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-08	0.0029
U-234	4.869E-09	0.0011	8.775E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-08	0.0024
U-235	1.477E-06	0.3476	8.419E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.089E-08	0.0026
U-238	2.990E-07	0.0704	7.444E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.276E-08	0.0030
Total	4.160E-06	0.9792	7.263E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.845E-08	0.0208

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 42
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.671E-08	0.0133
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.022E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.919E-09	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.648E-09	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.239E-06	0.5269
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.618E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.974E-08	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E-09	0.0005
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.255E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-17	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.428E-11	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.648E-22	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.078E-07	0.0254
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.506E-08	0.0035
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.488E-06	0.3502
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.118E-07	0.0734
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.249E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  43
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\MAINTENANCE_WORKER.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.179E-08	0.000E+00	0.000E+00	0.000E+00	7.321E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.321E-02
Am-241	2.655E-07	0.000E+00	0.000E+00	0.000E+00	8.920E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.920E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	1.002E-16	0.000E+00	0.000E+00	0.000E+00	3.367E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.367E-10
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	8.371E-11	0.000E+00	0.000E+00	0.000E+00	2.813E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.813E-04
Ni-63	6.872E-10	0.000E+00	0.000E+00	0.000E+00	2.309E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.309E-03
Np-237	1.291E-06	0.000E+00	0.000E+00	0.000E+00	4.338E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.338E+00
Pa-231	2.271E-08	0.000E+00	0.000E+00	0.000E+00	7.630E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.630E-02
Pb-210	1.900E-09	0.000E+00	0.000E+00	0.000E+00	6.385E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.385E-03
Pu-238	4.730E-10	0.000E+00	0.000E+00	0.000E+00	1.589E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.589E-03
Pu-239	1.240E-06	0.000E+00	0.000E+00	0.000E+00	4.165E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.165E+00
Pu-241	1.588E-27	0.000E+00	0.000E+00	0.000E+00	5.337E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.337E-21
Ra-226	2.017E-09	0.000E+00	0.000E+00	0.000E+00	6.778E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.778E-03
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	4.018E-17	0.000E+00	0.000E+00	0.000E+00	1.350E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.350E-10
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	1.089E-07	0.000E+00	0.000E+00	0.000E+00	3.661E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.661E-01
Th-230	1.085E-08	0.000E+00	0.000E+00	0.000E+00	3.647E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.647E-02
U-233	1.085E-06	0.000E+00	0.000E+00	0.000E+00	3.646E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.646E+00
U-234	1.085E-06	0.000E+00	0.000E+00	0.000E+00	3.646E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.646E+00
U-235	1.085E-06	0.000E+00	0.000E+00	0.000E+00	3.644E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.644E+00
U-238	1.085E-06	0.000E+00	0.000E+00	0.000E+00	3.644E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.644E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  09:48  Page  44
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.794E-08	0.0164	1.171E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.207E-09	0.0003
Am-241	1.539E-08	0.0037	2.451E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.927E-09	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	3.996E-16	0.0000	2.126E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.386E-19	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.974E-13	0.0000	2.974E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.011E-12	0.0000
Ni-63	0.000E+00	0.0000	9.029E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.001E-14	0.0000
Np-237	2.163E-06	0.5220	9.263E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.869E-09	0.0024
Pa-231	6.690E-09	0.0016	4.367E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.352E-10	0.0001
Pb-210	1.734E-11	0.0000	1.494E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.620E-10	0.0001
Pu-238	6.944E-14	0.0000	5.597E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.089E-12	0.0000
Pu-239	5.265E-10	0.0001	1.706E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.810E-08	0.0044
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	3.652E-08	0.0088	1.457E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.913E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.229E-18	0.0000	3.265E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.413E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	2.695E-07	0.0650	6.324E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.623E-09	0.0016
Th-230	1.918E-11	0.0000	9.328E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-10	0.0000
U-233	2.262E-09	0.0005	7.656E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.808E-09	0.0021
U-234	5.876E-10	0.0001	7.520E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.681E-09	0.0021
U-235	1.247E-06	0.3010	6.761E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.872E-09	0.0021
U-238	2.569E-07	0.0620	6.390E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-08	0.0026
Total	4.067E-06	0.9814	6.516E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.725E-08	0.0186

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 45
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.914E-08	0.0167
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.832E-08	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.999E-16	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.008E-12	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.001E-14	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.173E-06	0.5244
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.125E-09	0.0017
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.794E-10	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.159E-12	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.863E-08	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.660E-08	0.0088
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.761E-07	0.0666
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.289E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-08	0.0027
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.269E-09	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.256E-06	0.3031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.679E-07	0.0646
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.144E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 46
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.523E-08	0.0037	2.371E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.831E-09	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	3.996E-16	0.0000	2.126E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.386E-19	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.974E-13	0.0000	2.974E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.011E-12	0.0000
Ni-63	0.000E+00	0.0000	9.029E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.001E-14	0.0000
Np-237	2.164E-06	0.5221	9.313E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.925E-09	0.0024
Pu-238	1.072E-11	0.0000	8.382E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.479E-12	0.0000
Pu-239	5.278E-10	0.0001	1.706E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.810E-08	0.0044
Pu-241	5.244E-10	0.0001	8.170E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.757E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.229E-18	0.0000	3.265E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.413E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	2.711E-07	0.0654	1.393E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-08	0.0037
U-234	3.709E-08	0.0089	7.618E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.412E-09	0.0023
U-235	1.322E-06	0.3190	8.368E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-08	0.0025
U-238	2.570E-07	0.0620	6.412E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.098E-08	0.0027
Total	4.067E-06	0.9814	6.516E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.725E-08	0.0186

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 09:48 Page 47
Intrisk : Residual Dose and Risk Assessment for Maintenance/Surveillance Worker
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.806E-08	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.999E-16	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.008E-12	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.001E-14	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.174E-06	0.5245
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.020E-11	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.863E-08	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.220E-10	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.470E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.865E-07	0.0691
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.650E-08	0.0112
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-06	0.3215
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.679E-07	0.0647
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.144E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-4: Results of Radiological Risk Assessment for CERCLA Adult Trespasser Receptor

Table D-4-1: Radiological Risk Assessment For Adult Trespasser - EA A Plus B

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0.18	9E-09	1E-13	2E-09	1E-08	2.E-09	3.E-14	3.E-10	2.E-09	2E-09	3E-14	3E-10	2E-09	3.E-10	5.E-15	6.E-11	4.E-10
C-14	3.4	8E-14	2E-12	8E-13	3E-12	3.E-13	6.E-12	3.E-12	9.E-12	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	6E-07	3E-16	4E-10	6E-07	2.E-05	9.E-15	1.E-08	2.E-05	5E-17	2E-26	3E-20	5E-17	1.E-15	7.E-25	8.E-19	1.E-15
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	7E-11	2E-13	2E-09	2E-09	2.E-11	7.E-14	7.E-10	7.E-10	6E-11	2E-13	2E-09	2E-09	2.E-11	6.E-14	7.E-10	7.E-10
Pu-241	1.2	1E-10	4E-15	4E-11	2E-10	2.E-10	5.E-15	5.E-11	2.E-10	6E-11	9E-16	1E-11	7E-11	7.E-11	1.E-15	1.E-11	9.E-11
Se-79	2.4	2E-12	3E-17	5E-11	5E-11	4.E-12	8.E-17	1.E-10	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	1E-06	7E-16	2E-10	1E-06	4.E-05	2.E-14	7.E-09	4.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	5E-09	1E-15	9E-10	6E-09	8.E-08	2.E-14	2.E-08	1.E-07	1E-19	4E-26	3E-20	2E-19	2.E-18	7.E-25	5.E-19	3.E-18
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	8E-10	1E-13	1E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	3E-08	2E-13	2E-09	3E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	9E-11	1E-13	1E-09	1E-09	2.E-11	3.E-14	3.E-10	3.E-10	4E-09	9E-14	1E-09	5E-09	1.E-09	2.E-14	3.E-10	1.E-09
U-235	0.0089	2E-07	1E-13	1E-09	2E-07	2.E-09	9.E-16	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	1.E-09	9.E-16	1.E-11	1.E-09
U-238	0.19	4E-08	9E-14	2E-09	4E-08	7.E-09	2.E-14	3.E-10	7.E-09	3E-08	7E-14	1E-09	3E-08	6.E-09	1.E-14	2.E-10	6.E-09
				Excess Cancer Risk		**5.E-05**	**6.E-12**	**4.E-08**	**5.E-05**			**Excess Cancer Risk**		**9.E-09**	**1.E-13**	**1.E-09**	**1.E-08**

Table D-4-2: Radiological Risk Assessment For Adult Trespasser - EA C

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	8E-14	2E-12	8E-13	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	6E-07	3E-16	4E-10	6E-07	4.E-06	2.E-15	3.E-09	4.E-06	5E-17	2E-26	3E-20	5E-17	3.E-16	2.E-25	2.E-19	3.E-16
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	2E-17	1E-11	1E-11	0.E+00	9.E-17	5.E-11	5.E-11	0E+00	1E-20	6E-15	6E-15	0.E+00	5.E-20	3.E-14	3.E-14
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	2E-12	3E-17	5E-11	5E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	1E-06	7E-16	2E-10	1E-06	6.E-05	4.E-14	1.E-08	6.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	5E-09	1E-15	9E-10	6E-09	1.E-08	4.E-15	3.E-09	2.E-08	1E-19	4E-26	3E-20	2E-19	4.E-19	1.E-25	8.E-20	5.E-19
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	8E-10	1E-13	1E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	3E-08	2E-13	2E-09	3E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	9E-11	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	4E-09	9E-14	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09
U-238	0.28	4E-08	9E-14	2E-09	4E-08	1.E-08	3.E-14	4.E-10	1.E-08	3E-08	7E-14	1E-09	3E-08	8.E-09	2.E-14	4.E-10	9.E-09
				Excess Cancer Risk		**7.E-05**	**7.E-14**	**2.E-08**	**7.E-05**			**Excess Cancer Risk**		**1.E-08**	**2.E-14**	**4.E-10**	**1.E-08**

Table D-4-3: Radiological Risk Assessment For Adult Trespasser - EA E

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	8E-14	2E-12	8E-13	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	6E-07	3E-16	4E-10	6E-07	3.E-06	2.E-15	2.E-09	3.E-06	5E-17	2E-26	3E-20	5E-17	2.E-16	1.E-25	1.E-19	2.E-16
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	2E-12	3E-17	5E-11	5E-11	6.E-12	1.E-16	2.E-10	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	1E-06	7E-16	2E-10	1E-06	2.E-05	1.E-14	4.E-09	2.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	5E-09	1E-15	9E-10	6E-09	1.E-08	3.E-15	2.E-09	1.E-08	1E-19	4E-26	3E-20	2E-19	4.E-19	1.E-25	7.E-20	4.E-19
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	8E-10	1E-13	1E-09	2E-09	2.E-09	2.E-13	3.E-09	4.E-09	3E-08	2E-13	2E-09	3E-08	6.E-08	3.E-13	4.E-09	7.E-08
U-234	0.45	9E-11	1E-13	1E-09	1E-09	4.E-11	5.E-14	6.E-10	6.E-10	4E-09	9E-14	1E-09	5E-09	2.E-09	4.E-14	5.E-10	2.E-09
U-235	0.0012	2E-07	1E-13	1E-09	2E-07	2.E-10	1.E-16	2.E-12	2.E-10	2E-07	1E-13	1E-09	2E-07	2.E-10	1.E-16	1.E-12	2.E-10
U-238	0.28	4E-08	9E-14	2E-09	4E-08	1.E-08	3.E-14	4.E-10	1.E-08	3E-08	7E-14	1E-09	3E-08	8.E-09	2.E-14	4.E-10	9.E-09
				Excess Cancer Risk		**2.E-05**	**3.E-13**	**1.E-08**	**2.E-05**			**Excess Cancer Risk**		**7.E-08**	**4.E-13**	**4.E-09**	**8.E-08**

Table D-4-4: Radiological Risk Assessment For Adult Trespasser - EA F Plus G

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	8E-14	2E-12	8E-13	3E-12	1.E-12	2.E-11	9.E-12	3.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	6E-07	3E-16	4E-10	6E-07	2.E-06	1.E-15	1.E-09	2.E-06	5E-17	2E-26	3E-20	5E-17	2.E-16	8.E-26	9.E-20	2.E-16
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	2E-12	3E-17	5E-11	5E-11	4.E-12	8.E-17	1.E-10	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	1E-06	7E-16	2E-10	1E-06	3.E-06	2.E-15	6.E-10	3.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	5E-09	1E-15	9E-10	6E-09	1.E-09	4.E-16	3.E-10	2.E-09	1E-19	4E-26	3E-20	2E-19	4.E-20	1.E-26	8.E-21	5.E-20
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	8E-10	1E-13	1E-09	2E-09	1.E-09	2.E-13	2.E-09	3.E-09	3E-08	2E-13	2E-09	3E-08	5.E-08	2.E-13	3.E-09	5.E-08
U-234	0.3	9E-11	1E-13	1E-09	1E-09	3.E-11	3.E-14	4.E-10	4.E-10	4E-09	9E-14	1E-09	5E-09	1.E-09	3.E-14	3.E-10	2.E-09
U-235	0.01	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.24	4E-08	9E-14	2E-09	4E-08	9.E-09	2.E-14	4.E-10	9.E-09	3E-08	7E-14	1E-09	3E-08	7.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**5.E-06**	**2.E-11**	**5.E-09**	**5.E-06**			**Excess Cancer Risk**		**6.E-08**	**3.E-13**	**3.E-09**	**6.E-08**

Table D-4-5: Radiological Risk Assessment For Adult Trespasser - EA H Plus I

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	8E-14	2E-12	8E-13	3E-12	3.E-13	6.E-12	3.E-12	9.E-12	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-07	3E-16	4E-10	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	5E-17	2E-26	3E-20	5E-17	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	9E-11	7E-14	9E-11	0.E+00	7.E-09	6.E-12	7.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	2E-12	3E-17	5E-11	5E-11	4.E-12	9.E-17	1.E-10	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	1E-06	7E-16	2E-10	1E-06	9.E-06	5.E-15	2.E-09	9.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	5E-09	1E-15	9E-10	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-19	4E-26	3E-20	2E-19	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	8E-10	1E-13	1E-09	2E-09	1.E-09	2.E-13	2.E-09	3.E-09	3E-08	2E-13	2E-09	3E-08	5.E-08	3.E-13	3.E-09	5.E-08
U-234	0.35	9E-11	1E-13	1E-09	1E-09	3.E-11	4.E-14	4.E-10	5.E-10	4E-09	9E-14	1E-09	5E-09	2.E-09	3.E-14	4.E-10	2.E-09
U-235	0.0078	2E-07	1E-13	1E-09	2E-07	1.E-09	8.E-16	1.E-11	1.E-09	2E-07	1E-13	1E-09	2E-07	1.E-09	8.E-16	1.E-11	1.E-09
U-238	0.18	4E-08	9E-14	2E-09	4E-08	7.E-09	2.E-14	3.E-10	7.E-09	3E-08	7E-14	1E-09	3E-08	5.E-09	1.E-14	2.E-10	6.E-09
				Excess Cancer Risk		**9.E-06**	**7.E-09**	**5.E-09**	**9.E-06**			**Excess Cancer Risk**		**6.E-08**	**3.E-13**	**3.E-09**	**6.E-08**

Table D-4-6: Radiological Risk Assessment For Adult Trespasser - EA J

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	8E-14	2E-12	8E-13	3E-12	1.E-12	2.E-11	1.E-11	3.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	6E-07	3E-16	4E-10	6E-07	4.E-06	2.E-15	2.E-09	4.E-06	5E-17	2E-26	3E-20	5E-17	3.E-16	1.E-25	2.E-19	3.E-16
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-11	2E-13	2E-09	2E-09	2.E-12	1.E-14	1.E-10	1.E-10	1E-12	1E-16	1E-12	2E-12	8.E-14	7.E-18	7.E-14	2.E-13
Pu-239	0.038	7E-11	2E-13	2E-09	2E-09	3.E-12	8.E-15	9.E-11	9.E-11	6E-11	2E-13	2E-09	2E-09	2.E-12	8.E-15	8.E-11	8.E-11
Pu-241	0.14	1E-10	4E-15	4E-11	2E-10	2.E-11	6.E-16	6.E-12	2.E-11	6E-11	9E-16	1E-11	7E-11	9.E-12	1.E-16	2.E-12	1.E-11
Se-79	11.3	2E-12	3E-17	5E-11	5E-11	2.E-11	4.E-16	6.E-10	6.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-06	7E-16	2E-10	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	5E-09	1E-15	9E-10	6E-09	2.E-08	5.E-15	4.E-09	2.E-08	1E-19	4E-26	3E-20	2E-19	6.E-19	2.E-25	1.E-19	7.E-19
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	8E-10	1E-13	1E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	3E-08	2E-13	2E-09	3E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	9E-11	1E-13	1E-09	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	4E-09	9E-14	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.22	4E-08	9E-14	2E-09	4E-08	8.E-09	2.E-14	3.E-10	9.E-09	3E-08	7E-14	1E-09	3E-08	7.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**4.E-06**	**2.E-11**	**7.E-09**	**4.E-06**			**Excess Cancer Risk**		**8.E-09**	**3.E-14**	**4.E-10**	**8.E-09**

Table D-4-7: Radiological Risk Assessment For Adult Trespasser - EA L1 Plus L2

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	8E-14	2E-12	8E-13	3E-12	4.E-12	9.E-11	4.E-11	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	6E-07	3E-16	4E-10	6E-07	2.E-06	1.E-15	1.E-09	2.E-06	5E-17	2E-26	3E-20	5E-17	2.E-16	9.E-26	1.E-19	2.E-16
H-3	4.7	0E+00	9E-11	7E-14	9E-11	0.E+00	4.E-10	4.E-13	4.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-17	1E-11	1E-11	0.E+00	8.E-15	4.E-09	4.E-09	0E+00	1E-20	6E-15	6E-15	0.E+00	4.E-18	2.E-12	2.E-12
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	2E-12	3E-17	5E-11	5E-11	2.E-12	5.E-17	8.E-11	9.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	1E-06	7E-16	2E-10	1E-06	1.E-05	6.E-15	2.E-09	1.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	5E-09	1E-15	9E-10	6E-09	1.E-08	3.E-15	2.E-09	1.E-08	1E-19	4E-26	3E-20	2E-19	3.E-19	8.E-26	6.E-20	3.E-19
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	8E-10	1E-13	1E-09	2E-09	1.E-09	2.E-13	2.E-09	3.E-09	3E-08	2E-13	2E-09	3E-08	5.E-08	2.E-13	3.E-09	5.E-08
U-234	0.25	9E-11	1E-13	1E-09	1E-09	2.E-11	3.E-14	3.E-10	3.E-10	4E-09	9E-14	1E-09	5E-09	1.E-09	2.E-14	3.E-10	1.E-09
U-235	0.01	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.23	4E-08	9E-14	2E-09	4E-08	9.E-09	2.E-14	4.E-10	9.E-09	3E-08	7E-14	1E-09	3E-08	7.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**1.E-05**	**5.E-10**	**1.E-08**	**1.E-05**			**Excess Cancer Risk**		**6.E-08**	**3.E-13**	**3.E-09**	**6.E-08**

Table D-4-8: Radiological Risk Assessment For Adult Trespasser - EA P

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	2.2	9E-09	1E-13	2E-09	1E-08	2.E-08	3.E-13	4.E-09	2.E-08	2E-09	3E-14	3E-10	2E-09	4.E-09	6.E-14	7.E-10	5.E-09
C-14	0	8E-14	2E-12	8E-13	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	1E-06	1E-16	9E-11	1E-06	1.E-06	1.E-16	7.E-11	1.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	6E-07	3E-16	4E-10	6E-07	2.E-05	1.E-14	1.E-08	2.E-05	5E-17	2E-26	3E-20	5E-17	2.E-15	8.E-25	9.E-19	2.E-15
H-3	308	0E+00	9E-11	7E-14	9E-11	0.E+00	3.E-08	2.E-11	3.E-08	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	2E-09	6E-16	4E-09	6E-09	2.E-09	5.E-16	3.E-09	5.E-09	1E-13	3E-20	2E-13	4E-13	9.E-14	3.E-20	2.E-13	3.E-13
Ni-63	85	0E+00	2E-17	1E-11	1E-11	0.E+00	2.E-15	1.E-09	1.E-09	0E+00	1E-20	6E-15	6E-15	0.E+00	9.E-19	5.E-13	5.E-13
Np-237	1.5	3E-07	1E-13	1E-09	3E-07	4.E-07	2.E-13	2.E-09	4.E-07	3E-07	1E-13	1E-09	3E-07	4.E-07	2.E-13	2.E-09	4.E-07
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	7E-11	2E-13	2E-09	2E-09	7.E-10	2.E-12	2.E-08	3.E-08	6E-11	2E-13	2E-09	2E-09	7.E-10	2.E-12	2.E-08	2.E-08
Pu-241	39.9	1E-10	4E-15	4E-11	2E-10	5.E-09	2.E-13	2.E-09	7.E-09	6E-11	9E-16	1E-11	7E-11	2.E-09	4.E-14	5.E-10	3.E-09
Se-79	4.6	2E-12	3E-17	5E-11	5E-11	7.E-12	1.E-16	2.E-10	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-06	7E-16	2E-10	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	5E-09	1E-15	9E-10	6E-09	4.E-07	1.E-13	8.E-08	5.E-07	1E-19	4E-26	3E-20	2E-19	1.E-17	3.E-24	2.E-18	1.E-17
Tc-99	24	1E-11	6E-17	2E-11	3E-11	3.E-10	1.E-15	5.E-10	8.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	8E-10	1E-13	1E-09	2E-09	1.E-09	2.E-13	2.E-09	4.E-09	3E-08	2E-13	2E-09	3E-08	6.E-08	3.E-13	3.E-09	6.E-08
U-234	0.72	9E-11	1E-13	1E-09	1E-09	6.E-11	8.E-14	9.E-10	1.E-09	4E-09	9E-14	1E-09	5E-09	3.E-09	6.E-14	8.E-10	4.E-09
U-235	0.025	2E-07	1E-13	1E-09	2E-07	5.E-09	2.E-15	3.E-11	5.E-09	2E-07	1E-13	1E-09	2E-07	4.E-09	2.E-15	3.E-11	4.E-09
U-238	0.52	4E-08	9E-14	2E-09	4E-08	2.E-08	5.E-14	8.E-10	2.E-08	3E-08	7E-14	1E-09	3E-08	2.E-08	4.E-14	7.E-10	2.E-08
				Excess Cancer Risk		**2.E-05**	**3.E-08**	**1.E-07**	**2.E-05**			**Excess Cancer Risk**		**5.E-07**	**3.E-12**	**3.E-08**	**5.E-07**

Table D-4-9: Radiological Risk Assessment For Adult Trespasser - EA R

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)				RSR (1/(pCi/g)				Risk (unitless)			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	8E-14	2E-12	8E-13	3E-12	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-07	3E-16	4E-10	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	5E-17	2E-26	3E-20	5E-17	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	9E-11	7E-14	9E-11	0.E+00	2.E-10	2.E-13	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	2E-12	3E-17	5E-11	5E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	1E-06	7E-16	2E-10	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	5E-09	1E-15	9E-10	6E-09	2.E-09	5.E-16	4.E-10	2.E-09	1E-19	4E-26	3E-20	2E-19	5.E-20	1.E-26	1.E-20	6.E-20
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	8E-10	1E-13	1E-09	2E-09	2.E-09	3.E-13	3.E-09	5.E-09	3E-08	2E-13	2E-09	3E-08	8.E-08	4.E-13	4.E-09	8.E-08
U-234	0.22	9E-11	1E-13	1E-09	1E-09	2.E-11	2.E-14	3.E-10	3.E-10	4E-09	9E-14	1E-09	5E-09	9.E-10	2.E-14	2.E-10	1.E-09
U-235	0.01	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.22	4E-08	9E-14	2E-09	4E-08	8.E-09	2.E-14	3.E-10	9.E-09	3E-08	7E-14	1E-09	3E-08	7.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**1.E-08**	**2.E-10**	**4.E-09**	**2.E-08**			**Excess Cancer Risk**		**8.E-08**	**4.E-13**	**5.E-09**	**9.E-08**

Table D-4-10: Radiological Risk Assessment For Adult Trespasser - EA U

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
Am-241	0	9E-09	1E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	3E-14	3E-10	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	8E-14	2E-12	8E-13	3E-12	1.E-13	3.E-12	1.E-12	4.E-12	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	1E-06	1E-16	9E-11	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	6E-07	3E-16	4E-10	6E-07	1.E-06	7.E-16	8.E-10	1.E-06	5E-17	2E-26	3E-20	5E-17	1.E-16	5.E-26	6.E-20	1.E-16
H-3	0	0E+00	9E-11	7E-14	9E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-09	6E-16	4E-09	6E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-13	3E-20	2E-13	4E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-17	1E-11	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	6E-15	6E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	3E-07	1E-13	1E-09	3E-07	2.E-07	7.E-14	7.E-10	2.E-07	3E-07	1E-13	1E-09	3E-07	2.E-07	6.E-14	7.E-10	2.E-07
Pu-238	0	2E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	1E-12	1E-16	1E-12	2E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	2E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	1E-10	4E-15	4E-11	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	6E-11	9E-16	1E-11	7E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	2E-12	3E-17	5E-11	5E-11	4.E-12	9.E-17	1.E-10	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	1E-06	7E-16	2E-10	1E-06	7.E-06	4.E-15	1.E-09	7.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	5E-09	1E-15	9E-10	6E-09	2.E-08	5.E-15	4.E-09	2.E-08	1E-19	4E-26	3E-20	2E-19	6.E-19	2.E-25	1.E-19	7.E-19
Tc-99	0	1E-11	6E-17	2E-11	3E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	8E-10	1E-13	1E-09	2E-09	2.E-09	2.E-13	3.E-09	4.E-09	3E-08	2E-13	2E-09	3E-08	7.E-08	3.E-13	4.E-09	7.E-08
U-234	0.31	9E-11	1E-13	1E-09	1E-09	3.E-11	3.E-14	4.E-10	4.E-10	4E-09	9E-14	1E-09	5E-09	1.E-09	3.E-14	3.E-10	2.E-09
U-235	0.0089	2E-07	1E-13	1E-09	2E-07	2.E-09	9.E-16	1.E-11	2.E-09	2E-07	1E-13	1E-09	2E-07	1.E-09	9.E-16	1.E-11	1.E-09
U-238	0.21	4E-08	9E-14	2E-09	4E-08	8.E-09	2.E-14	3.E-10	8.E-09	3E-08	7E-14	1E-09	3E-08	6.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**9.E-06**	**3.E-12**	**1.E-08**	**9.E-06**			**Excess Cancer Risk**		**2.E-07**	**4.E-13**	**5.E-09**	**2.E-07**

Table D-4-11: Maximum Risk Assessment Results for Adult Trespasser

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Radiological COPCs										
External Gamma	5.E-05	7.E-05	2.E-05	5.E-06	9.E-06	4.E-06	1.E-05	2.E-05	1.E-08	9.E-06
Inhalation	6.E-12	7.E-14	3.E-13	2.E-11	7.E-09	2.E-11	5.E-10	3.E-08	2.E-10	3.E-12
Soil Ingestion	4.E-08	2.E-08	1.E-08	5.E-09	5.E-09	7.E-09	1.E-08	1.E-07	4.E-09	1.E-08
ELCR	5E-05	7E-05	2E-05	5E-06	9E-06	4E-06	1E-05	2E-05	2E-08	9E-06
Major Risk Contributors	None									

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR ADULT TRESPPASSER RECEPTOR

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   1
 Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Table of Contents

Part III: Intake Quantities and Health Risk Factors

Cancer Risk Slope Factors 2
Risk Slope and ETFG for the Ground Pathway 6
Amount of Intake Quantities and Excess Cancer Risks
Time= 0.000E+00 8
Time= 1.000E+00 13
Time= 3.000E+00 18
Time= 1.000E+01 23
Time= 3.000E+01 28
Time= 1.000E+02 33
Time= 3.000E+02 38
Time= 1.000E+03 43

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 2
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)

Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)
Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   3
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)

Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)
Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   4
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)

Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)

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 RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   5
 Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                   Current     Base      Parameter
  Menu                          Parameter                            Value      Case*       Name
 ------------------------------------------------------------------------------------------------------
 Sf-Rn  Bi-214                                                     1.50E-11   1.50E-11   SLPFRN(1,4)

 Sf-Rn  Radon K factors, (mrem/WLM):
 Sf-Rn  Rn-222 Indoor                                              7.60E+02   7.60E+02   KFACTR(1,1)
 Sf-Rn  Rn-222 Outdoor                                             5.70E+02   5.70E+02   KFACTR(1,2)
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 *Base Case means Default.Lib w/o Associate Nuclide contributions.
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   6
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	1.389E-02	1.389E-02	1.389E-02	1.389E-02	1.389E-02	1.389E-02	1.389E-02	1.389E-02
Ac-227	3.480E-10	1.392E-02	1.392E-02	1.392E-02	1.392E-02	1.392E-02	1.392E-02	1.392E-02	1.392E-02
Am-241	2.760E-08	1.398E-02	1.398E-02	1.398E-02	1.398E-02	1.398E-02	1.398E-02	1.398E-02	1.398E-02
At-217	1.320E-09	1.355E-02	1.355E-02	1.355E-02	1.355E-02	1.355E-02	1.355E-02	1.355E-02	1.355E-02
At-218	3.570E-09	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02
Ba-137m	2.690E-06	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02
Bi-210	2.760E-09	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02
Bi-211	1.880E-07	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02
Bi-213	5.650E-07	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Bi-214	7.480E-06	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02
C-14	7.830E-12	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02
Co-60	1.240E-05	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02	1.359E-02
Cs-137	5.320E-10	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02
Fr-221	1.110E-07	1.380E-02	1.380E-02	1.380E-02	1.380E-02	1.380E-02	1.380E-02	1.380E-02	1.380E-02
Fr-223	1.400E-07	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02
H-3	0.000E+00	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02
I-129	6.100E-09	1.433E-02	1.433E-02	1.433E-02	1.433E-02	1.433E-02	1.433E-02	1.433E-02	1.433E-02
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02
Pa-231	1.390E-07	1.368E-02	1.368E-02	1.368E-02	1.368E-02	1.368E-02	1.368E-02	1.368E-02	1.368E-02
Pa-233	7.430E-07	1.370E-02	1.370E-02	1.370E-02	1.370E-02	1.370E-02	1.370E-02	1.370E-02	1.370E-02
Pa-234	8.710E-06	1.358E-02	1.358E-02	1.358E-02	1.358E-02	1.358E-02	1.358E-02	1.358E-02	1.358E-02
Pa-234m	6.870E-08	1.357E-02	1.357E-02	1.357E-02	1.357E-02	1.357E-02	1.357E-02	1.357E-02	1.357E-02
Pb-209	5.370E-10	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02
Pb-210	1.410E-09	1.410E-02	1.410E-02	1.410E-02	1.410E-02	1.410E-02	1.410E-02	1.410E-02	1.410E-02
Pb-211	2.290E-07	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Pb-214	9.820E-07	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02	1.367E-02
Po-210	3.950E-11	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Po-211	3.580E-08	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02
Po-215	7.480E-10	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Po-218	4.260E-11	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Pu-238	7.220E-11	1.461E-02	1.461E-02	1.461E-02	1.461E-02	1.461E-02	1.461E-02	1.461E-02	1.461E-02
Pu-239	2.000E-10	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02
Pu-241	4.110E-12	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02
Ra-223	4.340E-07	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02	1.375E-02
Ra-225	5.910E-09	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02	1.408E-02
Ra-226	2.290E-08	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02
Rn-219	2.250E-07	1.369E-02	1.369E-02	1.369E-02	1.369E-02	1.369E-02	1.369E-02	1.369E-02	1.369E-02
Rn-222	1.740E-09	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02
Sb-126	1.280E-05	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02	1.348E-02

Sb-126m	6.940E-06	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02	1.349E-02
Se-79	1.100E-11	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02	1.397E-02
Sn-126	9.960E-08	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02
Sr-90	4.820E-10	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02
Tc-99	8.140E-11	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02	1.393E-02
Th-227	3.780E-07	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02	1.381E-02
Th-229	2.250E-07	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02
Th-230	8.190E-10	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   7
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02	1.395E-02
Th-234	1.630E-08	1.394E-02	1.394E-02	1.394E-02	1.394E-02	1.394E-02	1.394E-02	1.394E-02	1.394E-02
Tl-207	1.520E-08	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02
Tl-209	9.830E-06	1.364E-02	1.364E-02	1.364E-02	1.364E-02	1.364E-02	1.364E-02	1.364E-02	1.364E-02
Tl-210	0.000E+00	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02	1.500E-02
U-233	9.820E-10	1.387E-02	1.387E-02	1.387E-02	1.387E-02	1.387E-02	1.387E-02	1.387E-02	1.387E-02
U-234	2.520E-10	1.405E-02	1.405E-02	1.405E-02	1.405E-02	1.405E-02	1.405E-02	1.405E-02	1.405E-02
U-235	5.180E-07	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02	1.385E-02
U-237	3.760E-07	1.386E-02	1.386E-02	1.386E-02	1.386E-02	1.386E-02	1.386E-02	1.386E-02	1.386E-02
U-238	4.990E-11	1.456E-02	1.456E-02	1.456E-02	1.456E-02	1.456E-02	1.456E-02	1.456E-02	1.456E-02
Y-90	1.910E-08	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02	1.356E-02

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 8
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
C-14	1.360E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Co-60	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Cs-137	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
H-3	1.143E+02	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
I-129	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Ni-63	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Np-237	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Pu-239	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Pu-241	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Sn-126	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Sr-90	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Tc-99	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
U-234	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
U-235	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
U-238	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page   9
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.592E-11	0.0000	4.468E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.605E-13	0.0000
Am-241	9.203E-09	0.0026	1.465E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.750E-09	0.0005
C-14	7.643E-14	0.0000	1.669E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.591E-13	0.0000
Co-60	1.225E-06	0.3456	1.196E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.876E-11	0.0000
Cs-137	6.304E-07	0.1779	3.354E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.763E-10	0.0001
H-3	0.000E+00	0.0000	9.223E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.477E-14	0.0000
I-129	1.873E-09	0.0005	5.583E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.775E-09	0.0011
Ni-63	0.000E+00	0.0000	2.063E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-11	0.0000
Np-237	2.621E-07	0.0740	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0003
Pa-231	1.155E-11	0.0000	7.538E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.513E-13	0.0000
Pb-210	8.415E-17	0.0000	7.252E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.728E-15	0.0000
Pu-238	2.305E-11	0.0000	1.858E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.022E-09	0.0006
Pu-239	6.644E-11	0.0000	2.153E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0006
Pu-241	2.630E-12	0.0000	2.007E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.776E-11	0.0000
Ra-226	1.032E-12	0.0000	4.119E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.520E-15	0.0000
Se-79	1.514E-12	0.0000	3.195E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.228E-11	0.0000
Sn-126	1.174E-06	0.3314	6.628E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.116E-10	0.0001
Sr-90	4.835E-09	0.0014	1.285E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.495E-10	0.0003
Tc-99	1.117E-11	0.0000	6.117E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.158E-11	0.0000
Th-229	4.328E-10	0.0001	1.016E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.064E-11	0.0000
Th-230	2.948E-14	0.0000	1.434E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-13	0.0000
U-233	3.261E-10	0.0001	1.104E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-09	0.0004
U-234	8.473E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-09	0.0004
U-235	1.799E-07	0.0508	9.751E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-09	0.0004
U-238	3.706E-08	0.0105	9.217E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.581E-09	0.0004
Total	3.525E-06	0.9949	9.497E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E-08	0.0051

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  10
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.638E-11	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.095E-08	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.504E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-06	0.3457
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.308E-07	0.1780
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.648E-09	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0743
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.230E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.812E-15	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.045E-09	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.351E-09	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.035E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.174E-06	0.3314
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.784E-09	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.275E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.434E-10	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.981E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.596E-09	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-07	0.0511
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.864E-08	0.0109
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.544E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 11
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.080E-09	0.0026	1.445E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-09	0.0005
C-14	7.643E-14	0.0000	1.669E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.591E-13	0.0000
Co-60	1.225E-06	0.3456	1.196E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.876E-11	0.0000
Cs-137	6.304E-07	0.1779	3.354E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.763E-10	0.0001
H-3	0.000E+00	0.0000	9.223E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.477E-14	0.0000
I-129	1.873E-09	0.0005	5.583E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.775E-09	0.0011
Ni-63	0.000E+00	0.0000	2.063E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-11	0.0000
Np-237	2.621E-07	0.0740	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0003
Pu-238	2.305E-11	0.0000	1.858E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.022E-09	0.0006
Pu-239	6.644E-11	0.0000	2.153E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0006
Pu-241	1.264E-10	0.0000	3.977E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.129E-11	0.0000
Se-79	1.514E-12	0.0000	3.195E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.228E-11	0.0000
Sn-126	1.174E-06	0.3314	6.628E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.116E-10	0.0001
Sr-90	4.835E-09	0.0014	1.285E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.495E-10	0.0003
Tc-99	1.117E-11	0.0000	6.117E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.158E-11	0.0000
U-233	7.588E-10	0.0002	1.114E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-09	0.0004
U-234	8.579E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-09	0.0004
U-235	1.800E-07	0.0508	9.763E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-09	0.0004
U-238	3.706E-08	0.0105	9.217E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.581E-09	0.0004
Total	3.525E-06	0.9949	9.497E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.815E-08	0.0051

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 12
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.081E-08	0.0030
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.504E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-06	0.3457
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.308E-07	0.1780
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.648E-09	0.0016
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0743
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.045E-09	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.351E-09	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.677E-10	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.174E-06	0.3314
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.784E-09	0.0016
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.275E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-09	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-07	0.0511
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.864E-08	0.0109
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.544E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 13
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	5.428E-14	0.000E+00	0.000E+00	0.000E+00	1.824E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.824E-07
Am-241	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
C-14	3.213E-01	0.000E+00	0.000E+00	0.000E+00	1.293E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.293E-01
Co-60	1.428E-07	0.000E+00	0.000E+00	0.000E+00	4.799E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.799E-01
Cs-137	1.592E-07	0.000E+00	0.000E+00	0.000E+00	5.349E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.349E-01
H-3	3.981E+01	0.000E+00	0.000E+00	0.000E+00	1.907E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.907E-01
I-129	1.614E-07	0.000E+00	0.000E+00	0.000E+00	5.422E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.422E-01
Ni-63	1.617E-07	0.000E+00	0.000E+00	0.000E+00	5.434E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.434E-01
Np-237	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Pa-231	3.447E-12	0.000E+00	0.000E+00	0.000E+00	1.158E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.158E-05
Pb-210	3.266E-18	0.000E+00	0.000E+00	0.000E+00	1.097E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.097E-11
Pu-238	1.616E-07	0.000E+00	0.000E+00	0.000E+00	5.432E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.432E-01
Pu-239	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.475E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.475E-01
Pu-241	1.553E-07	0.000E+00	0.000E+00	0.000E+00	5.217E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.217E-01
Ra-226	3.176E-16	0.000E+00	0.000E+00	0.000E+00	1.067E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.067E-09
Se-79	1.490E-07	0.000E+00	0.000E+00	0.000E+00	5.005E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.005E-01
Sn-126	1.490E-07	0.000E+00	0.000E+00	0.000E+00	5.005E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.005E-01
Sr-90	1.590E-07	0.000E+00	0.000E+00	0.000E+00	5.344E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.344E-01
Tc-99	1.490E-07	0.000E+00	0.000E+00	0.000E+00	5.005E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.005E-01
Th-229	1.538E-11	0.000E+00	0.000E+00	0.000E+00	5.169E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.169E-05
Th-230	1.467E-12	0.000E+00	0.000E+00	0.000E+00	4.928E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.928E-06
U-233	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
U-234	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
U-235	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
U-238	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  14
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.908E-11	0.0000	5.013E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.167E-13	0.0000
Am-241	9.196E-09	0.0028	1.464E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-09	0.0005
C-14	1.804E-14	0.0000	3.940E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.792E-13	0.0000
Co-60	1.074E-06	0.3276	1.049E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.781E-11	0.0000
Cs-137	6.159E-07	0.1879	3.277E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.677E-10	0.0001
H-3	0.000E+00	0.0000	3.212E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.604E-14	0.0000
I-129	1.855E-09	0.0006	5.529E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E-09	0.0011
Ni-63	0.000E+00	0.0000	2.047E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-11	0.0000
Np-237	2.621E-07	0.0800	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0004
Pa-231	1.251E-11	0.0000	8.165E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.137E-13	0.0000
Pb-210	9.850E-17	0.0000	8.489E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.193E-15	0.0000
Pu-238	2.287E-11	0.0000	1.844E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-09	0.0006
Pu-239	6.643E-11	0.0000	2.152E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0007
Pu-241	2.506E-12	0.0000	1.913E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.692E-11	0.0000
Ra-226	1.167E-12	0.0000	4.654E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.847E-15	0.0000
Se-79	1.384E-12	0.0000	2.921E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.779E-11	0.0000
Sn-126	1.074E-06	0.3276	6.060E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.934E-10	0.0001
Sr-90	4.719E-09	0.0014	1.254E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.268E-10	0.0003
Tc-99	1.021E-11	0.0000	5.592E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-11	0.0000
Th-229	4.688E-10	0.0001	1.100E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-11	0.0000
Th-230	3.193E-14	0.0000	1.553E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.826E-13	0.0000
U-233	3.260E-10	0.0001	1.104E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-09	0.0004
U-234	8.471E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-09	0.0004
U-235	1.799E-07	0.0549	9.749E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-09	0.0004
U-238	3.705E-08	0.0113	9.215E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.580E-09	0.0005
Total	3.259E-06	0.9945	3.359E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.803E-08	0.0055

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 15
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.960E-11	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.094E-08	0.0033
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.913E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-06	0.3277
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.163E-07	0.1881
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.593E-09	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0803
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.332E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.292E-15	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.029E-09	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.351E-09	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.943E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.169E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.917E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-06	0.3277
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.646E-09	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.994E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.803E-10	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.596E-09	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-07	0.0553
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.863E-08	0.0118
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.277E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 16
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.065E-09	0.0028	1.443E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.723E-09	0.0005
C-14	1.804E-14	0.0000	3.940E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.792E-13	0.0000
Co-60	1.074E-06	0.3276	1.049E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.781E-11	0.0000
Cs-137	6.159E-07	0.1879	3.277E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.677E-10	0.0001
H-3	0.000E+00	0.0000	3.212E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.604E-14	0.0000
I-129	1.855E-09	0.0006	5.529E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E-09	0.0011
Ni-63	0.000E+00	0.0000	2.047E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-11	0.0000
Np-237	2.621E-07	0.0800	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0004
Pu-238	2.287E-11	0.0000	1.844E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.006E-09	0.0006
Pu-239	6.643E-11	0.0000	2.152E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0007
Pu-241	1.346E-10	0.0000	4.016E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-11	0.0000
Se-79	1.384E-12	0.0000	2.921E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.779E-11	0.0000
Sn-126	1.074E-06	0.3276	6.060E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.934E-10	0.0001
Sr-90	4.719E-09	0.0014	1.254E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.268E-10	0.0003
Tc-99	1.021E-11	0.0000	5.592E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-11	0.0000
U-233	7.948E-10	0.0002	1.114E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-09	0.0004
U-234	8.590E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-09	0.0004
U-235	1.799E-07	0.0549	9.762E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.281E-09	0.0004
U-238	3.705E-08	0.0113	9.215E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.580E-09	0.0005
Total	3.259E-06	0.9945	3.359E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.803E-08	0.0055

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 17
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.079E-08	0.0033
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.913E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-06	0.3277
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.163E-07	0.1881
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.215E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.593E-09	0.0017
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0803
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.029E-09	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.351E-09	0.0007
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.767E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.917E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-06	0.3277
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.646E-09	0.0017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.994E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-09	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-09	0.0004
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.812E-07	0.0553
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.863E-08	0.0118
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.277E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 18
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.780E-13	0.000E+00	0.000E+00	0.000E+00	1.606E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.606E-06
Am-241	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.472E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.472E-01
C-14	1.789E-02	0.000E+00	0.000E+00	0.000E+00	7.201E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.201E-03
Co-60	1.097E-07	0.000E+00	0.000E+00	0.000E+00	3.688E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.688E-01
Cs-137	1.519E-07	0.000E+00	0.000E+00	0.000E+00	5.105E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.105E-01
H-3	4.827E+00	0.000E+00	0.000E+00	0.000E+00	2.313E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.313E-02
I-129	1.583E-07	0.000E+00	0.000E+00	0.000E+00	5.318E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.318E-01
Ni-63	1.593E-07	0.000E+00	0.000E+00	0.000E+00	5.352E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.352E-01
Np-237	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
Pa-231	1.034E-11	0.000E+00	0.000E+00	0.000E+00	3.473E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.473E-05
Pb-210	8.678E-17	0.000E+00	0.000E+00	0.000E+00	2.916E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.916E-10
Pu-238	1.591E-07	0.000E+00	0.000E+00	0.000E+00	5.346E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.346E-01
Pu-239	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.474E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.474E-01
Pu-241	1.410E-07	0.000E+00	0.000E+00	0.000E+00	4.738E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.738E-01
Ra-226	2.857E-15	0.000E+00	0.000E+00	0.000E+00	9.600E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.600E-09
Se-79	1.245E-07	0.000E+00	0.000E+00	0.000E+00	4.183E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.183E-01
Sn-126	1.245E-07	0.000E+00	0.000E+00	0.000E+00	4.183E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.183E-01
Sr-90	1.515E-07	0.000E+00	0.000E+00	0.000E+00	5.091E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.091E-01
Tc-99	1.245E-07	0.000E+00	0.000E+00	0.000E+00	4.183E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.183E-01
Th-229	4.614E-11	0.000E+00	0.000E+00	0.000E+00	1.550E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.550E-04
Th-230	4.399E-12	0.000E+00	0.000E+00	0.000E+00	1.478E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.478E-05
U-233	1.628E-07	0.000E+00	0.000E+00	0.000E+00	5.471E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.471E-01
U-234	1.628E-07	0.000E+00	0.000E+00	0.000E+00	5.471E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.471E-01
U-235	1.628E-07	0.000E+00	0.000E+00	0.000E+00	5.471E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.471E-01
U-238	1.628E-07	0.000E+00	0.000E+00	0.000E+00	5.471E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.471E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 19
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.605E-11	0.0000	6.214E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.405E-13	0.0000
Am-241	9.181E-09	0.0033	1.462E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-09	0.0006
C-14	1.004E-15	0.0000	2.192E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.970E-15	0.0000
Co-60	8.250E-07	0.2922	8.059E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.979E-11	0.0000
Cs-137	5.878E-07	0.2082	3.127E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.509E-10	0.0001
H-3	0.000E+00	0.0000	3.891E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.155E-15	0.0000
I-129	1.819E-09	0.0006	5.423E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.667E-09	0.0013
Ni-63	0.000E+00	0.0000	2.017E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-11	0.0000
Np-237	2.621E-07	0.0928	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0004
Pa-231	1.443E-11	0.0000	9.418E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.386E-13	0.0000
Pb-210	1.324E-16	0.0000	1.141E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.294E-15	0.0000
Pu-238	2.251E-11	0.0000	1.814E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.974E-09	0.0007
Pu-239	6.642E-11	0.0000	2.152E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0008
Pu-241	2.276E-12	0.0000	1.737E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-11	0.0000
Ra-226	1.467E-12	0.0000	5.853E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.581E-15	0.0000
Se-79	1.157E-12	0.0000	2.441E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.994E-11	0.0000
Sn-126	8.972E-07	0.3178	5.065E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.617E-10	0.0001
Sr-90	4.496E-09	0.0016	1.195E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.829E-10	0.0003
Tc-99	8.535E-12	0.0000	4.674E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.649E-11	0.0000
Th-229	5.408E-10	0.0002	1.269E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.329E-11	0.0000
Th-230	3.684E-14	0.0000	1.792E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.107E-13	0.0000
U-233	3.259E-10	0.0001	1.103E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.269E-09	0.0004
U-234	8.468E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-09	0.0004
U-235	1.798E-07	0.0637	9.745E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-09	0.0005
U-238	3.703E-08	0.0131	9.211E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.580E-09	0.0006
Total	2.806E-06	0.9937	4.982E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.780E-08	0.0063

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 20
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.669E-11	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-08	0.0039
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.290E-14	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.250E-07	0.2922
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.882E-07	0.2083
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.894E-12	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.486E-09	0.0019
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0932
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.536E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.426E-15	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-09	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.350E-09	0.0008
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.110E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.974E-07	0.3178
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-09	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.541E-10	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.476E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.595E-09	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-07	0.0641
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.861E-08	0.0137
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 21
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.035E-09	0.0032	1.438E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0006
C-14	1.004E-15	0.0000	2.192E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.970E-15	0.0000
Co-60	8.250E-07	0.2922	8.059E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.979E-11	0.0000
Cs-137	5.878E-07	0.2082	3.127E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.509E-10	0.0001
H-3	0.000E+00	0.0000	3.891E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.155E-15	0.0000
I-129	1.819E-09	0.0006	5.423E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.667E-09	0.0013
Ni-63	0.000E+00	0.0000	2.017E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-11	0.0000
Np-237	2.621E-07	0.0928	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.196E-09	0.0004
Pu-238	2.251E-11	0.0000	1.814E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.974E-09	0.0007
Pu-239	6.642E-11	0.0000	2.152E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-09	0.0008
Pu-241	1.499E-10	0.0001	4.087E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.344E-11	0.0000
Se-79	1.157E-12	0.0000	2.441E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.994E-11	0.0000
Sn-126	8.972E-07	0.3178	5.065E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.617E-10	0.0001
Sr-90	4.496E-09	0.0016	1.195E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.829E-10	0.0003
Tc-99	8.535E-12	0.0000	4.674E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.649E-11	0.0000
U-233	8.666E-10	0.0003	1.116E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.282E-09	0.0005
U-234	8.617E-11	0.0000	1.084E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-09	0.0004
U-235	1.798E-07	0.0637	9.761E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-09	0.0005
U-238	3.703E-08	0.0131	9.211E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.580E-09	0.0006
Total	2.806E-06	0.9937	4.982E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.780E-08	0.0063

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 22
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.075E-08	0.0038
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.290E-14	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.250E-07	0.2922
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.882E-07	0.2083
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.894E-12	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.486E-09	0.0019
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.633E-07	0.0932
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.997E-09	0.0007
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.350E-09	0.0008
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.934E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.110E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.974E-07	0.3178
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.379E-09	0.0019
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.149E-09	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-07	0.0642
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.861E-08	0.0137
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 23
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.933E-12	0.000E+00	0.000E+00	0.000E+00	1.657E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.657E-05
Am-241	1.623E-07	0.000E+00	0.000E+00	0.000E+00	5.454E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.454E-01
C-14	7.146E-07	0.000E+00	0.000E+00	0.000E+00	2.876E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.876E-07
Co-60	4.365E-08	0.000E+00	0.000E+00	0.000E+00	1.467E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.467E-01
Cs-137	1.290E-07	0.000E+00	0.000E+00	0.000E+00	4.336E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.336E-01
H-3	2.958E-03	0.000E+00	0.000E+00	0.000E+00	1.417E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.417E-05
I-129	1.479E-07	0.000E+00	0.000E+00	0.000E+00	4.970E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.970E-01
Ni-63	1.510E-07	0.000E+00	0.000E+00	0.000E+00	5.075E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.075E-01
Np-237	1.629E-07	0.000E+00	0.000E+00	0.000E+00	5.473E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.473E-01
Pa-231	3.440E-11	0.000E+00	0.000E+00	0.000E+00	1.156E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.156E-04
Pb-210	3.044E-15	0.000E+00	0.000E+00	0.000E+00	1.023E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.023E-08
Pu-238	1.505E-07	0.000E+00	0.000E+00	0.000E+00	5.056E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.056E-01
Pu-239	1.628E-07	0.000E+00	0.000E+00	0.000E+00	5.470E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.470E-01
Pu-241	1.006E-07	0.000E+00	0.000E+00	0.000E+00	3.381E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.381E-01
Ra-226	3.168E-14	0.000E+00	0.000E+00	0.000E+00	1.065E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.065E-07
Se-79	6.645E-08	0.000E+00	0.000E+00	0.000E+00	2.233E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.233E-01
Sn-126	6.645E-08	0.000E+00	0.000E+00	0.000E+00	2.233E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.233E-01
Sr-90	1.279E-07	0.000E+00	0.000E+00	0.000E+00	4.297E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.297E-01
Tc-99	6.645E-08	0.000E+00	0.000E+00	0.000E+00	2.233E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.233E-01
Th-229	1.536E-10	0.000E+00	0.000E+00	0.000E+00	5.162E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.162E-04
Th-230	1.465E-11	0.000E+00	0.000E+00	0.000E+00	4.923E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.923E-05
U-233	1.626E-07	0.000E+00	0.000E+00	0.000E+00	5.463E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.463E-01
U-234	1.626E-07	0.000E+00	0.000E+00	0.000E+00	5.463E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.463E-01
U-235	1.626E-07	0.000E+00	0.000E+00	0.000E+00	5.463E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.463E-01
U-238	1.626E-07	0.000E+00	0.000E+00	0.000E+00	5.463E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.463E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  24
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.652E-11	0.0000	1.146E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-12	0.0000
Am-241	9.120E-09	0.0050	1.452E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.734E-09	0.0010
C-14	3.998E-20	0.0000	8.729E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.970E-19	0.0000
Co-60	3.281E-07	0.1805	3.205E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-11	0.0000
Cs-137	4.993E-07	0.2747	2.656E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-10	0.0002
H-3	0.000E+00	0.0000	2.378E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-18	0.0000
I-129	1.700E-09	0.0009	5.067E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.427E-09	0.0019
Ni-63	0.000E+00	0.0000	1.912E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-11	0.0000
Np-237	2.620E-07	0.1441	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-09	0.0007
Pa-231	2.113E-11	0.0000	1.379E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.375E-12	0.0000
Pb-210	3.174E-16	0.0000	2.735E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E-14	0.0000
Pu-238	2.129E-11	0.0000	1.716E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.867E-09	0.0010
Pu-239	6.638E-11	0.0000	2.151E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-09	0.0013
Pu-241	1.624E-12	0.0000	1.240E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-11	0.0000
Ra-226	2.854E-12	0.0000	1.139E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.967E-15	0.0000
Se-79	6.173E-13	0.0000	1.303E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.132E-11	0.0000
Sn-126	4.789E-07	0.2634	2.703E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.629E-11	0.0000
Sr-90	3.794E-09	0.0021	1.008E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.451E-10	0.0004
Tc-99	4.556E-12	0.0000	2.495E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.801E-12	0.0000
Th-229	7.924E-10	0.0004	1.860E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.947E-11	0.0000
Th-230	5.400E-14	0.0000	2.626E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.088E-13	0.0000
U-233	3.254E-10	0.0002	1.101E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.267E-09	0.0007
U-234	8.455E-11	0.0000	1.082E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-09	0.0007
U-235	1.795E-07	0.0988	9.730E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.277E-09	0.0007
U-238	3.698E-08	0.0203	9.197E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-09	0.0009
Total	1.801E-06	0.9906	1.060E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-08	0.0094

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 25
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.770E-11	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-08	0.0060
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.281E-07	0.1805
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-07	0.2748
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.380E-15	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.126E-09	0.0028
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-07	0.1448
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.250E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.061E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.888E-09	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.349E-09	0.0013
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.194E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.790E-07	0.2635
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.539E-09	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.119E-10	0.0004
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.629E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-09	0.0009
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.334E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.808E-07	0.0995
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.855E-08	0.0212
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.818E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 26
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	8.931E-09	0.0049	1.422E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.698E-09	0.0009
C-14	3.998E-20	0.0000	8.729E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.970E-19	0.0000
Co-60	3.281E-07	0.1805	3.205E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.378E-11	0.0000
Cs-137	4.993E-07	0.2747	2.656E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-10	0.0002
H-3	0.000E+00	0.0000	2.378E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.928E-18	0.0000
I-129	1.700E-09	0.0009	5.067E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.427E-09	0.0019
Ni-63	0.000E+00	0.0000	1.912E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-11	0.0000
Np-237	2.620E-07	0.1441	1.122E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-09	0.0007
Pu-238	2.129E-11	0.0000	1.716E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.867E-09	0.0010
Pu-239	6.638E-11	0.0000	2.151E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.282E-09	0.0013
Pu-241	1.926E-10	0.0001	4.279E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.727E-11	0.0000
Se-79	6.173E-13	0.0000	1.303E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.132E-11	0.0000
Sn-126	4.789E-07	0.2634	2.703E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.629E-11	0.0000
Sr-90	3.794E-09	0.0021	1.008E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.451E-10	0.0004
Tc-99	4.556E-12	0.0000	2.495E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.801E-12	0.0000
U-233	1.118E-09	0.0006	1.120E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.287E-09	0.0007
U-234	8.745E-11	0.0000	1.082E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-09	0.0007
U-235	1.796E-07	0.0988	9.755E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-09	0.0007
U-238	3.698E-08	0.0203	9.197E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-09	0.0009
Total	1.801E-06	0.9906	1.060E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.710E-08	0.0094

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 27
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.063E-08	0.0058
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.281E-07	0.1805
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-07	0.2748
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.380E-15	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.126E-09	0.0028
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.632E-07	0.1448
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.889E-09	0.0010
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.349E-09	0.0013
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.399E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.194E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.790E-07	0.2635
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.539E-09	0.0025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-09	0.0013
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-09	0.0007
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.809E-07	0.0995
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.855E-08	0.0212
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.818E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 28
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.645E-11	0.000E+00	0.000E+00	0.000E+00	1.225E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.225E-04
Am-241	1.590E-07	0.000E+00	0.000E+00	0.000E+00	5.344E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.344E-01
C-14	1.631E-19	0.000E+00	0.000E+00	0.000E+00	6.565E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.565E-20
Co-60	3.132E-09	0.000E+00	0.000E+00	0.000E+00	1.053E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.053E-02
Cs-137	8.094E-08	0.000E+00	0.000E+00	0.000E+00	2.720E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.720E-01
H-3	1.759E-12	0.000E+00	0.000E+00	0.000E+00	8.426E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.426E-15
I-129	1.218E-07	0.000E+00	0.000E+00	0.000E+00	4.094E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.094E-01
Ni-63	1.298E-07	0.000E+00	0.000E+00	0.000E+00	4.361E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.361E-01
Np-237	1.627E-07	0.000E+00	0.000E+00	0.000E+00	5.468E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.468E-01
Pa-231	1.027E-10	0.000E+00	0.000E+00	0.000E+00	3.452E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.452E-04
Pb-210	7.099E-14	0.000E+00	0.000E+00	0.000E+00	2.385E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.385E-07
Pu-238	1.283E-07	0.000E+00	0.000E+00	0.000E+00	4.313E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.313E-01
Pu-239	1.625E-07	0.000E+00	0.000E+00	0.000E+00	5.461E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.461E-01
Pu-241	3.838E-08	0.000E+00	0.000E+00	0.000E+00	1.290E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.290E-01
Ra-226	2.836E-13	0.000E+00	0.000E+00	0.000E+00	9.531E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.531E-07
Se-79	1.105E-08	0.000E+00	0.000E+00	0.000E+00	3.713E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.713E-02
Sn-126	1.105E-08	0.000E+00	0.000E+00	0.000E+00	3.713E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.713E-02
Sr-90	7.875E-08	0.000E+00	0.000E+00	0.000E+00	2.646E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-01
Tc-99	1.105E-08	0.000E+00	0.000E+00	0.000E+00	3.714E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.714E-02
Th-229	4.594E-10	0.000E+00	0.000E+00	0.000E+00	1.544E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.544E-03
Th-230	4.385E-11	0.000E+00	0.000E+00	0.000E+00	1.474E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.474E-04
U-233	1.619E-07	0.000E+00	0.000E+00	0.000E+00	5.440E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.440E-01
U-234	1.619E-07	0.000E+00	0.000E+00	0.000E+00	5.440E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.440E-01
U-235	1.619E-07	0.000E+00	0.000E+00	0.000E+00	5.440E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.440E-01
U-238	1.619E-07	0.000E+00	0.000E+00	0.000E+00	5.440E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.440E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  29
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.919E-10	0.0002	3.308E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.410E-12	0.0000
Am-241	8.891E-09	0.0096	1.415E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.691E-09	0.0018
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.355E-08	0.0255	2.300E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.706E-12	0.0000
Cs-137	3.132E-07	0.3388	1.666E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.870E-10	0.0002
H-3	0.000E+00	0.0000	1.403E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.137E-27	0.0000
I-129	1.400E-09	0.0015	4.175E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-09	0.0031
Ni-63	0.000E+00	0.0000	1.643E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.101E-12	0.0000
Np-237	2.618E-07	0.2832	1.121E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.194E-09	0.0013
Pa-231	4.016E-11	0.0000	2.622E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.613E-12	0.0000
Pb-210	1.630E-15	0.0000	1.405E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.284E-14	0.0000
Pu-238	1.816E-11	0.0000	1.464E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.592E-09	0.0017
Pu-239	6.627E-11	0.0001	2.147E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.278E-09	0.0025
Pu-241	6.196E-13	0.0000	4.728E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.183E-12	0.0000
Ra-226	9.674E-12	0.0000	3.860E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.361E-14	0.0000
Se-79	1.027E-13	0.0000	2.167E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.545E-12	0.0000
Sn-126	7.964E-08	0.0862	4.496E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.435E-11	0.0000
Sr-90	2.337E-09	0.0025	6.211E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.589E-10	0.0005
Tc-99	7.577E-13	0.0000	4.150E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.464E-12	0.0000
Th-229	1.508E-09	0.0016	3.540E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.707E-11	0.0000
Th-230	1.029E-13	0.0000	5.003E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.884E-13	0.0000
U-233	3.240E-10	0.0004	1.097E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.262E-09	0.0014
U-234	8.419E-11	0.0001	1.077E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-09	0.0013
U-235	1.787E-07	0.1934	9.688E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-09	0.0014
U-238	3.682E-08	0.0398	9.157E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.570E-09	0.0017
Total	9.086E-07	0.9831	1.027E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-08	0.0169

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 30
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.953E-10	0.0002
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.058E-08	0.0114
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.355E-08	0.0255
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.134E-07	0.3390
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.224E-09	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.101E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.630E-07	0.2845
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.278E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.447E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-09	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.345E-09	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.803E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.698E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.966E-08	0.0862
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.796E-09	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.222E-12	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.545E-09	0.0017
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.913E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.586E-09	0.0017
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.328E-09	0.0014
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.800E-07	0.1948
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.839E-08	0.0415
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.242E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 31
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	8.642E-09	0.0094	1.375E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.642E-09	0.0018
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.355E-08	0.0255	2.300E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.706E-12	0.0000
Cs-137	3.132E-07	0.3388	1.666E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.870E-10	0.0002
H-3	0.000E+00	0.0000	1.403E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.137E-27	0.0000
I-129	1.400E-09	0.0015	4.175E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.823E-09	0.0031
Ni-63	0.000E+00	0.0000	1.643E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.101E-12	0.0000
Np-237	2.618E-07	0.2832	1.121E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.194E-09	0.0013
Pu-238	1.817E-11	0.0000	1.464E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-09	0.0017
Pu-239	6.628E-11	0.0001	2.147E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.278E-09	0.0025
Pu-241	2.538E-10	0.0003	4.503E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.232E-11	0.0001
Se-79	1.027E-13	0.0000	2.167E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.545E-12	0.0000
Sn-126	7.964E-08	0.0862	4.496E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.435E-11	0.0000
Sr-90	2.337E-09	0.0025	6.211E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.589E-10	0.0005
Tc-99	7.577E-13	0.0000	4.150E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.464E-12	0.0000
U-233	1.832E-09	0.0020	1.132E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-09	0.0014
U-234	9.395E-11	0.0001	1.078E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-09	0.0013
U-235	1.790E-07	0.1937	9.747E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.277E-09	0.0014
U-238	3.682E-08	0.0398	9.158E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-09	0.0017
Total	9.086E-07	0.9831	1.027E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-08	0.0169

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 32
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-08	0.0111
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.355E-08	0.0255
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.134E-07	0.3390
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.224E-09	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.101E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.630E-07	0.2845
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-09	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.345E-09	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.062E-10	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.966E-08	0.0862
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.796E-09	0.0030
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.222E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.131E-09	0.0034
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-09	0.0014
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.803E-07	0.1950
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.839E-08	0.0415
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.242E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 33
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.341E-10	0.000E+00	0.000E+00	0.000E+00	7.866E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.866E-04
Am-241	1.428E-07	0.000E+00	0.000E+00	0.000E+00	4.797E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.797E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	3.101E-13	0.000E+00	0.000E+00	0.000E+00	1.042E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.042E-06
Cs-137	1.582E-08	0.000E+00	0.000E+00	0.000E+00	5.315E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.315E-02
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	6.185E-08	0.000E+00	0.000E+00	0.000E+00	2.078E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.078E-01
Ni-63	7.635E-08	0.000E+00	0.000E+00	0.000E+00	2.565E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.565E-01
Np-237	1.622E-07	0.000E+00	0.000E+00	0.000E+00	5.452E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.452E-01
Pa-231	3.370E-10	0.000E+00	0.000E+00	0.000E+00	1.132E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.132E-03
Pb-210	1.719E-12	0.000E+00	0.000E+00	0.000E+00	5.775E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.775E-06
Pu-238	7.355E-08	0.000E+00	0.000E+00	0.000E+00	2.471E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.471E-01
Pu-239	1.616E-07	0.000E+00	0.000E+00	0.000E+00	5.430E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.430E-01
Pu-241	1.316E-09	0.000E+00	0.000E+00	0.000E+00	4.421E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.421E-03
Ra-226	3.092E-12	0.000E+00	0.000E+00	0.000E+00	1.039E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.039E-05
Se-79	2.073E-11	0.000E+00	0.000E+00	0.000E+00	6.964E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.964E-05
Sn-126	2.073E-11	0.000E+00	0.000E+00	0.000E+00	6.967E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.967E-05
Sr-90	1.444E-08	0.000E+00	0.000E+00	0.000E+00	4.851E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.851E-02
Tc-99	2.074E-11	0.000E+00	0.000E+00	0.000E+00	6.969E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.969E-05
Th-229	1.515E-09	0.000E+00	0.000E+00	0.000E+00	5.090E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.090E-03
Th-230	1.450E-10	0.000E+00	0.000E+00	0.000E+00	4.874E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.874E-04
U-233	1.594E-07	0.000E+00	0.000E+00	0.000E+00	5.358E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.358E-01
U-234	1.595E-07	0.000E+00	0.000E+00	0.000E+00	5.359E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.359E-01
U-235	1.594E-07	0.000E+00	0.000E+00	0.000E+00	5.358E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.358E-01
U-238	1.594E-07	0.000E+00	0.000E+00	0.000E+00	5.358E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.358E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  34
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.064E-10	0.0014	1.390E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.433E-11	0.0000
Am-241	7.955E-09	0.0142	1.266E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.513E-09	0.0027
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.332E-12	0.0000	2.278E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.690E-16	0.0000
Cs-137	6.120E-08	0.1089	3.256E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.654E-11	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.108E-10	0.0013	2.119E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.433E-09	0.0025
Ni-63	0.000E+00	0.0000	9.666E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.354E-12	0.0000
Np-237	2.610E-07	0.4644	1.118E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-09	0.0021
Pa-231	1.054E-10	0.0002	6.883E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.860E-12	0.0000
Pb-210	1.956E-14	0.0000	1.686E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.341E-13	0.0000
Pu-238	1.041E-11	0.0000	8.388E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.125E-10	0.0016
Pu-239	6.589E-11	0.0001	2.135E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.265E-09	0.0040
Pu-241	2.124E-14	0.0000	1.621E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.434E-13	0.0000
Ra-226	6.599E-11	0.0001	2.633E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-13	0.0000
Se-79	1.926E-16	0.0000	4.064E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.650E-15	0.0000
Sn-126	1.494E-10	0.0003	8.435E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-14	0.0000
Sr-90	4.284E-10	0.0008	1.139E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.413E-11	0.0001
Tc-99	1.422E-15	0.0000	7.787E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.747E-15	0.0000
Th-229	3.979E-09	0.0071	9.339E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.779E-11	0.0002
Th-230	2.722E-13	0.0000	1.324E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.557E-12	0.0000
U-233	3.191E-10	0.0006	1.080E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.243E-09	0.0022
U-234	8.293E-11	0.0001	1.061E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-09	0.0022
U-235	1.761E-07	0.3133	9.542E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-09	0.0022
U-238	3.626E-08	0.0645	9.019E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-09	0.0028
Total	5.492E-07	0.9772	9.474E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-08	0.0228

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 35
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.208E-10	0.0015
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.468E-09	0.0168
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.332E-12	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.124E-08	0.1090
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.144E-09	0.0038
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.354E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.622E-07	0.4665
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-10	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.537E-13	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.230E-10	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.331E-09	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-13	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.616E-11	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.842E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-10	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.125E-10	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.169E-15	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.077E-09	0.0073
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.829E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-09	0.0028
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-09	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.773E-07	0.3155
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.781E-08	0.0673
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.620E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 36
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.700E-09	0.0137	1.225E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.462E-09	0.0026
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.332E-12	0.0000	2.278E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.690E-16	0.0000
Cs-137	6.120E-08	0.1089	3.256E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.654E-11	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.108E-10	0.0013	2.119E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.433E-09	0.0025
Ni-63	0.000E+00	0.0000	9.666E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.354E-12	0.0000
Np-237	2.610E-07	0.4644	1.118E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-09	0.0021
Pu-238	1.043E-11	0.0000	8.390E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.128E-10	0.0016
Pu-239	6.591E-11	0.0001	2.135E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.265E-09	0.0040
Pu-241	2.638E-10	0.0005	4.212E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-11	0.0001
Se-79	1.926E-16	0.0000	4.064E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.650E-15	0.0000
Sn-126	1.494E-10	0.0003	8.435E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-14	0.0000
Sr-90	4.284E-10	0.0008	1.139E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.413E-11	0.0001
Tc-99	1.422E-15	0.0000	7.787E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.747E-15	0.0000
U-233	4.297E-09	0.0076	1.173E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.340E-09	0.0024
U-234	1.492E-10	0.0003	1.062E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.227E-09	0.0022
U-235	1.770E-07	0.3149	9.750E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.273E-09	0.0023
U-238	3.626E-08	0.0645	9.022E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-09	0.0028
Total	5.492E-07	0.9772	9.474E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-08	0.0228

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 37
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.163E-09	0.0163
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.332E-12	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.124E-08	0.1090
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.144E-09	0.0038
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.354E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.622E-07	0.4665
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.233E-10	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.331E-09	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.141E-10	0.0006
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.842E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-10	0.0003
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.125E-10	0.0009
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.169E-15	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.637E-09	0.0100
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.376E-09	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.782E-07	0.3171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.781E-08	0.0673
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.620E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 38
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.575E-10	0.000E+00	0.000E+00	0.000E+00	2.881E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.881E-03
Am-241	1.025E-07	0.000E+00	0.000E+00	0.000E+00	3.444E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.444E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	1.124E-24	0.000E+00	0.000E+00	0.000E+00	3.776E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.776E-18
Cs-137	1.491E-10	0.000E+00	0.000E+00	0.000E+00	5.010E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.010E-04
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	8.913E-09	0.000E+00	0.000E+00	0.000E+00	2.995E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.995E-02
Ni-63	1.676E-08	0.000E+00	0.000E+00	0.000E+00	5.632E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.632E-02
Np-237	1.609E-07	0.000E+00	0.000E+00	0.000E+00	5.406E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.406E-01
Pa-231	9.661E-10	0.000E+00	0.000E+00	0.000E+00	3.246E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.246E-03
Pb-210	2.142E-11	0.000E+00	0.000E+00	0.000E+00	7.196E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.196E-05
Pu-238	1.499E-08	0.000E+00	0.000E+00	0.000E+00	5.035E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.035E-02
Pu-239	1.589E-07	0.000E+00	0.000E+00	0.000E+00	5.340E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.340E-01
Pu-241	8.580E-14	0.000E+00	0.000E+00	0.000E+00	2.883E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.883E-07
Ra-226	2.638E-11	0.000E+00	0.000E+00	0.000E+00	8.864E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.864E-05
Se-79	3.353E-19	0.000E+00	0.000E+00	0.000E+00	1.127E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.127E-12
Sn-126	3.357E-19	0.000E+00	0.000E+00	0.000E+00	1.128E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.128E-12
Sr-90	1.134E-10	0.000E+00	0.000E+00	0.000E+00	3.809E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.809E-04
Tc-99	3.361E-19	0.000E+00	0.000E+00	0.000E+00	1.129E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.129E-12
Th-229	4.406E-09	0.000E+00	0.000E+00	0.000E+00	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.480E-02
Th-230	4.255E-10	0.000E+00	0.000E+00	0.000E+00	1.430E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.430E-03
U-233	1.527E-07	0.000E+00	0.000E+00	0.000E+00	5.131E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.131E-01
U-234	1.527E-07	0.000E+00	0.000E+00	0.000E+00	5.132E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.132E-01
U-235	1.527E-07	0.000E+00	0.000E+00	0.000E+00	5.130E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.130E-01
U-238	1.527E-07	0.000E+00	0.000E+00	0.000E+00	5.130E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.130E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 39
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.648E-09	0.0054	4.563E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.704E-11	0.0001
Am-241	5.711E-09	0.0116	9.092E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.086E-09	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	8.446E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.121E-28	0.0000
Cs-137	5.769E-10	0.0012	3.069E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.444E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.024E-10	0.0002	3.054E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.065E-10	0.0004
Ni-63	0.000E+00	0.0000	2.122E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-12	0.0000
Np-237	2.588E-07	0.5245	1.108E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.181E-09	0.0024
Pa-231	2.807E-10	0.0006	1.832E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.826E-11	0.0000
Pb-210	1.994E-13	0.0000	1.719E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.466E-12	0.0000
Pu-238	2.120E-12	0.0000	1.709E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.859E-10	0.0004
Pu-239	6.480E-11	0.0001	2.100E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.228E-09	0.0045
Pu-241	1.385E-18	0.0000	1.057E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.351E-18	0.0000
Ra-226	4.839E-10	0.0010	1.931E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.181E-12	0.0000
Se-79	3.116E-24	0.0000	6.334E-29	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.076E-22	0.0000
Sn-126	2.419E-18	0.0000	1.366E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.360E-22	0.0000
Sr-90	3.364E-12	0.0000	8.940E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.605E-13	0.0000
Tc-99	2.304E-23	0.0000	1.262E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.451E-23	0.0000
Th-229	1.075E-08	0.0218	2.522E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.641E-10	0.0005
Th-230	7.415E-13	0.0000	3.606E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.241E-12	0.0000
U-233	3.056E-10	0.0006	1.034E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.190E-09	0.0024
U-234	7.942E-11	0.0002	1.016E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-09	0.0024
U-235	1.686E-07	0.3417	9.138E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.199E-09	0.0024
U-238	3.472E-08	0.0704	8.637E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.481E-09	0.0030
Total	4.831E-07	0.9792	8.436E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-08	0.0208

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 40
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.695E-09	0.0055
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.797E-09	0.0138
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.447E-24	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.772E-10	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.090E-10	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.600E-07	0.5269
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.989E-10	0.0006
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.666E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.881E-10	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.293E-09	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.074E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.851E-10	0.0010
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E-18	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.024E-12	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.756E-23	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-08	0.0223
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.983E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.496E-09	0.0030
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.698E-07	0.3441
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.621E-08	0.0734
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.934E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 41
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	5.541E-09	0.0112	8.790E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.050E-09	0.0021
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	8.446E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.121E-28	0.0000
Cs-137	5.769E-10	0.0012	3.069E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.444E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.024E-10	0.0002	3.054E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.065E-10	0.0004
Ni-63	0.000E+00	0.0000	2.122E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-12	0.0000
Np-237	2.588E-07	0.5245	1.110E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.182E-09	0.0024
Pu-238	2.233E-12	0.0000	1.712E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.863E-10	0.0004
Pu-239	6.485E-11	0.0001	2.100E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.228E-09	0.0045
Pu-241	1.909E-10	0.0004	3.029E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.618E-11	0.0001
Se-79	3.116E-24	0.0000	6.334E-29	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.076E-22	0.0000
Sn-126	2.419E-18	0.0000	1.366E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.360E-22	0.0000
Sr-90	3.364E-12	0.0000	8.940E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.605E-13	0.0000
Tc-99	2.304E-23	0.0000	1.262E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.451E-23	0.0000
U-233	1.104E-08	0.0224	1.285E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.452E-09	0.0029
U-234	5.639E-10	0.0011	1.019E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-09	0.0024
U-235	1.715E-07	0.3476	9.777E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-09	0.0026
U-238	3.473E-08	0.0704	8.646E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.482E-09	0.0030
Total	4.831E-07	0.9792	8.436E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.027E-08	0.0208

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 42
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.591E-09	0.0134
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.447E-24	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.772E-10	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.090E-10	0.0006
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.600E-07	0.5269
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.886E-10	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.293E-09	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.271E-10	0.0005
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.420E-18	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.024E-12	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.756E-23	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.250E-08	0.0253
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-09	0.0035
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.728E-07	0.3502
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.621E-08	0.0734
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.934E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  43
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.635E-09	0.000E+00	0.000E+00	0.000E+00	8.856E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.856E-03
Am-241	3.211E-08	0.000E+00	0.000E+00	0.000E+00	1.079E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.079E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	1.212E-17	0.000E+00	0.000E+00	0.000E+00	4.073E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.073E-11
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	1.013E-11	0.000E+00	0.000E+00	0.000E+00	3.403E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.403E-05
Ni-63	8.312E-11	0.000E+00	0.000E+00	0.000E+00	2.793E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.793E-04
Np-237	1.562E-07	0.000E+00	0.000E+00	0.000E+00	5.248E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.248E-01
Pa-231	2.747E-09	0.000E+00	0.000E+00	0.000E+00	9.230E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.230E-03
Pb-210	2.298E-10	0.000E+00	0.000E+00	0.000E+00	7.723E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.723E-04
Pu-238	5.722E-11	0.000E+00	0.000E+00	0.000E+00	1.923E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.923E-04
Pu-239	1.499E-07	0.000E+00	0.000E+00	0.000E+00	5.039E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.039E-01
Pu-241	1.921E-28	0.000E+00	0.000E+00	0.000E+00	6.456E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.456E-22
Ra-226	2.440E-10	0.000E+00	0.000E+00	0.000E+00	8.199E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.199E-04
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	4.861E-18	0.000E+00	0.000E+00	0.000E+00	1.633E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.633E-11
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	1.318E-08	0.000E+00	0.000E+00	0.000E+00	4.428E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.428E-02
Th-230	1.313E-09	0.000E+00	0.000E+00	0.000E+00	4.412E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.412E-03
U-233	1.313E-07	0.000E+00	0.000E+00	0.000E+00	4.410E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.410E-01
U-234	1.312E-07	0.000E+00	0.000E+00	0.000E+00	4.410E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.410E-01
U-235	1.312E-07	0.000E+00	0.000E+00	0.000E+00	4.409E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.409E-01
U-238	1.312E-07	0.000E+00	0.000E+00	0.000E+00	4.409E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.409E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  44
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

0
0

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.886E-09	0.0164	1.359E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E-10	0.0003
Am-241	1.789E-09	0.0037	2.848E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.402E-10	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.690E-17	0.0000	2.495E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.800E-20	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.164E-13	0.0000	3.469E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.346E-13	0.0000
Ni-63	0.000E+00	0.0000	1.052E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.829E-15	0.0000
Np-237	2.512E-07	0.5220	1.076E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.146E-09	0.0024
Pa-231	7.766E-10	0.0016	5.070E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.052E-11	0.0001
Pb-210	2.011E-12	0.0000	1.733E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.521E-11	0.0001
Pu-238	8.095E-15	0.0000	6.525E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.099E-13	0.0000
Pu-239	6.114E-11	0.0001	1.981E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.102E-09	0.0044
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	4.237E-09	0.0088	1.690E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.034E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.442E-19	0.0000	3.834E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.833E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	3.128E-08	0.0650	7.341E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.688E-10	0.0016
Th-230	2.226E-12	0.0000	1.083E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.273E-11	0.0000
U-233	2.627E-10	0.0005	8.891E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-09	0.0021
U-234	6.825E-11	0.0001	8.734E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.008E-09	0.0021
U-235	1.449E-07	0.3010	7.852E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-09	0.0021
U-238	2.984E-08	0.0620	7.421E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.273E-09	0.0026
Total	4.723E-07	0.9814	7.567E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.971E-09	0.0186

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:07  Page  45
Intrisk : Residual Dose and Risk Assessment for Adult Trespasser
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_ADULT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.026E-09	0.0167
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.129E-09	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.693E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.510E-13	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.829E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.524E-07	0.5244
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.271E-10	0.0017
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.722E-11	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.180E-13	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.163E-09	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.247E-09	0.0088
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.205E-08	0.0666
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.496E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.286E-09	0.0027
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-09	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.459E-07	0.3031
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.111E-08	0.0646
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.813E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon	Radionuclides							
Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 46
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.770E-09	0.0037	2.755E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.290E-10	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.690E-17	0.0000	2.495E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.800E-20	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.164E-13	0.0000	3.469E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.346E-13	0.0000
Ni-63	0.000E+00	0.0000	1.052E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.829E-15	0.0000
Np-237	2.513E-07	0.5221	1.082E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.153E-09	0.0024
Pu-238	1.244E-12	0.0000	9.759E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-12	0.0000
Pu-239	6.130E-11	0.0001	1.981E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.102E-09	0.0044
Pu-241	6.095E-11	0.0001	9.496E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.442E-19	0.0000	3.834E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.833E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	3.147E-08	0.0654	1.617E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.785E-09	0.0037
U-234	4.304E-09	0.0089	8.848E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.093E-09	0.0023
U-235	1.535E-07	0.3190	9.718E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.221E-09	0.0025
U-238	2.984E-08	0.0620	7.447E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.276E-09	0.0027
Total	4.723E-07	0.9814	7.567E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.971E-09	0.0186

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:07 Page 47
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.099E-09	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.693E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.510E-13	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.829E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.524E-07	0.5245
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.348E-12	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.164E-09	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.229E-11	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.326E-08	0.0691
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.397E-09	0.0112
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.548E-07	0.3215
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.112E-08	0.0647
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.813E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-5: Results of Radiological Risk Assessment for CERCLA Youth Trespasser Receptor

Table D-5-1: Radiological Risk Assessment For Youth Trespasser - EA A Plus B

Nuclide	EPC pCi/g	T=0 Year RSR (1/(pCi/g) Ground	Inhalation	Soil	Total	Risk (unitless) Ground	Inhalation	Soil	**Total**	% Cont	T=1000 Year RSR (1/(pCi/g) Ground	Inhalation	Soil	Total	Risk (unitless) Ground	Inhalation	Soil	Total
Am-241	0.18	1E-08	2E-13	2E-09	1E-08	2.E-09	3.E-14	4.E-10	3.E-09		2E-09	4E-14	4E-10	3E-09	4.E-10	6.E-15	8.E-11	5.E-10
C-14	3.4	3E-13	7E-12	3E-12	1E-11	1.E-12	2.E-11	1.E-11	4.E-11		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	1E-06	5E-16	6E-10	1E-06	3.E-05	1.E-14	2.E-08	3.E-05	24%	7E-17	4E-26	4E-20	7E-17	2.E-15	1.E-24	1.E-18	2.E-15
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00		2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00		3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00		2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	9E-11	3E-13	3E-09	3E-09	3.E-11	9.E-14	9.E-10	9.E-10		8E-11	3E-13	3E-09	3E-09	2.E-11	8.E-14	8.E-10	9.E-10
Pu-241	1.2	6E-11	5E-15	4E-11	1E-10	8.E-11	6.E-15	5.E-11	1.E-10		8E-11	1E-15	1E-11	9E-11	1.E-10	1.E-15	2.E-11	1.E-10
Se-79	2.4	4E-12	7E-17	1E-10	1E-10	8.E-12	2.E-16	3.E-10	3.E-10		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	3E-06	2E-15	5E-10	3E-06	9.E-05	5.E-14	2.E-08	9.E-05	76%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	8E-09	2E-15	1E-09	9E-09	1.E-07	3.E-14	3.E-08	2.E-07		2E-19	6E-26	4E-20	3E-19	4.E-18	1.E-24	8.E-19	5.E-18
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	6E-10	1E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00		4E-08	2E-13	2E-09	4E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	1E-10	1E-13	2E-09	2E-09	3.E-11	4.E-14	4.E-10	4.E-10		5E-09	1E-13	1E-09	7E-09	1.E-09	3.E-14	4.E-10	2.E-09
U-235	0.0089	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09		2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.19	5E-08	1E-13	2E-09	5E-08	9.E-09	2.E-14	4.E-10	9.E-09		4E-08	1E-13	2E-09	4E-08	7.E-09	2.E-14	3.E-10	8.E-09
				Excess Cancer Risk		**1.E-04**	**3.E-11**	**6.E-08**	**1.1.E-04**				**Excess Cancer Risk**		**1.E-08**	**1.E-13**	**2.E-09**	**1.E-08**

Table D-5-2: Radiological Risk Assessment For Youth Trespasser - EA C

		T=0 Year									T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				Risk (unitless)					RSR (1/(pCi/g)				Risk (unitless)			
	pCi/g	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	**% Cont**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00		2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-13	7E-12	3E-12	1E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	1E-06	5E-16	6E-10	1E-06	7.E-06	4.E-15	4.E-09	7.E-06	5%	7E-17	4E-26	4E-20	7E-17	5.E-16	3.E-25	3.E-19	5.E-16
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00		2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	3E-17	2E-11	2E-11	0.E+00	1.E-16	7.E-11	7.E-11		0E+00	1E-20	8E-15	8E-15	0.E+00	6.E-20	4.E-14	4.E-14
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00		3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00		2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00		8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00		8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	4E-12	7E-17	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	3E-06	2E-15	5E-10	3E-06	1.E-04	8.E-14	3.E-08	1.E-04	95%	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	8E-09	2E-15	1E-09	9E-09	2.E-08	6.E-15	4.E-09	3.E-08		2E-19	6E-26	4E-20	3E-19	7.E-19	2.E-25	1.E-19	8.E-19
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00		0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	6E-10	1E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00		4E-08	2E-13	2E-09	4E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-10	1E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00		5E-09	1E-13	1E-09	7E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-07	1E-13	2E-09	2E-07	3.E-09	2.E-15	2.E-11	3.E-09		2E-07	1E-13	2E-09	2E-07	3.E-09	2.E-15	2.E-11	3.E-09
U-238	0.28	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	6.E-10	1.E-08		4E-08	1E-13	2E-09	4E-08	1.E-08	3.E-14	5.E-10	1.E-08
				Excess Cancer Risk		**2.E-04**	**1.E-13**	**4.E-08**	**2.E-04**				**Excess Cancer Risk**		**1.E-08**	**3.E-14**	**5.E-10**	**1.E-08**

Table D-5-3: Radiological Risk Assessment For Youth Trespasser - EA E

Nuclide	EPC pCi/g	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-13	7E-12	3E-12	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	1E-06	5E-16	6E-10	1E-06	5.E-06	3.E-15	3.E-09	5.E-06	7E-17	4E-26	4E-20	7E-17	4.E-16	2.E-25	2.E-19	4.E-16
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	4E-12	7E-17	1E-10	1E-10	1.E-11	3.E-16	5.E-10	5.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	3E-06	2E-15	5E-10	3E-06	5.E-05	3.E-14	9.E-09	5.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	8E-09	2E-15	1E-09	9E-09	2.E-08	5.E-15	4.E-09	2.E-08	2E-19	6E-26	4E-20	3E-19	6.E-19	1.E-25	1.E-19	7.E-19
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	6E-10	1E-13	2E-09	2E-09	1.E-09	3.E-13	3.E-09	4.E-09	4E-08	2E-13	2E-09	4E-08	8.E-08	4.E-13	5.E-09	8.E-08
U-234	0.45	1E-10	1E-13	2E-09	2E-09	5.E-11	6.E-14	7.E-10	8.E-10	5E-09	1E-13	1E-09	7E-09	2.E-09	5.E-14	6.E-10	3.E-09
U-235	0.0012	2E-07	1E-13	2E-09	2E-07	3.E-10	2.E-16	2.E-12	3.E-10	2E-07	1E-13	2E-09	2E-07	2.E-10	1.E-16	2.E-12	2.E-10
U-238	0.28	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	6.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	1.E-08	3.E-14	5.E-10	1.E-08
				Excess Cancer Risk		**6.E-05**	**4.E-13**	**2.E-08**	**6.E-05**			**Excess Cancer Risk**		**9.E-08**	**5.E-13**	**6.E-09**	**1.E-07**

Table D-5-4: Radiological Risk Assessment For Youth Trespasser - EA F Plus G

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
	pCi/g	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	3E-13	7E-12	3E-12	1E-11	4.E-12	9.E-11	4.E-11	1.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	1E-06	5E-16	6E-10	1E-06	3.E-06	2.E-15	2.E-09	3.E-06	7E-17	4E-26	4E-20	7E-17	2.E-16	1.E-25	1.E-19	2.E-16
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	4E-12	7E-17	1E-10	1E-10	8.E-12	2.E-16	3.E-10	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	3E-06	2E-15	5E-10	3E-06	7.E-06	4.E-15	1.E-09	7.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	8E-09	2E-15	1E-09	9E-09	2.E-09	6.E-16	4.E-10	3.E-09	2E-19	6E-26	4E-20	3E-19	7.E-20	2.E-26	1.E-20	8.E-20
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	6E-10	1E-13	2E-09	2E-09	9.E-10	2.E-13	2.E-09	3.E-09	4E-08	2E-13	2E-09	4E-08	6.E-08	3.E-13	3.E-09	6.E-08
U-234	0.3	1E-10	1E-13	2E-09	2E-09	3.E-11	4.E-14	5.E-10	5.E-10	5E-09	1E-13	1E-09	7E-09	2.E-09	3.E-14	4.E-10	2.E-09
U-235	0.01	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09
U-238	0.24	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	5.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	9.E-09	2.E-14	4.E-10	1.E-08
				Excess Cancer Risk		**1.E-05**	**9.E-11**	**7.E-09**	**1.E-05**			**Excess Cancer Risk**		**7.E-08**	**4.E-13**	**4.E-09**	**8.E-08**

Table D-5-5: Radiological Risk Assessment For Youth Trespasser - EA H Plus I

Nuclide	EPC pCi/g	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	3E-13	7E-12	3E-12	1E-11	1.E-12	3.E-11	1.E-11	4.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	1E-06	5E-16	6E-10	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	7E-17	4E-26	4E-20	7E-17	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	4E-10	3E-13	4E-10	0.E+00	3.E-08	2.E-11	3.E-08	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	4E-12	7E-17	1E-10	1E-10	9.E-12	2.E-16	3.E-10	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	3E-06	2E-15	5E-10	3E-06	2.E-05	1.E-14	4.E-09	2.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	8E-09	2E-15	1E-09	9E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-19	6E-26	4E-20	3E-19	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	6E-10	1E-13	2E-09	2E-09	9.E-10	2.E-13	3.E-09	4.E-09	4E-08	2E-13	2E-09	4E-08	6.E-08	3.E-13	4.E-09	7.E-08
U-234	0.35	1E-10	1E-13	2E-09	2E-09	4.E-11	5.E-14	6.E-10	6.E-10	5E-09	1E-13	1E-09	7E-09	2.E-09	4.E-14	5.E-10	2.E-09
U-235	0.0078	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.18	5E-08	1E-13	2E-09	5E-08	9.E-09	2.E-14	4.E-10	9.E-09	4E-08	1E-13	2E-09	4E-08	7.E-09	2.E-14	3.E-10	7.E-09
				Excess Cancer Risk		**2.E-05**	**3.E-08**	**8.E-09**	**2.E-05**			**Excess Cancer Risk**		**7.E-08**	**4.E-13**	**4.E-09**	**8.E-08**

Table D-5-6: Radiological Risk Assessment For Youth Trespasser - EA J

Nuclide	EPC pCi/g	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	3E-13	7E-12	3E-12	1E-11	5.E-12	1.E-10	5.E-11	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	1E-06	5E-16	6E-10	1E-06	6.E-06	3.E-15	3.E-09	6.E-06	7E-17	4E-26	4E-20	7E-17	4.E-16	2.E-25	2.E-19	4.E-16
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	3E-11	3E-13	3E-09	3E-09	2.E-12	2.E-14	2.E-10	2.E-10	2E-12	1E-16	1E-12	3E-12	1.E-13	9.E-18	1.E-13	2.E-13
Pu-239	0.038	9E-11	3E-13	3E-09	3E-09	3.E-12	1.E-14	1.E-10	1.E-10	8E-11	3E-13	3E-09	3E-09	3.E-12	1.E-14	1.E-10	1.E-10
Pu-241	0.14	6E-11	5E-15	4E-11	1E-10	9.E-12	6.E-16	6.E-12	2.E-11	8E-11	1E-15	1E-11	9E-11	1.E-11	2.E-16	2.E-12	1.E-11
Se-79	11.3	4E-12	7E-17	1E-10	1E-10	4.E-11	8.E-16	1.E-09	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	3E-06	2E-15	5E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	8E-09	2E-15	1E-09	9E-09	3.E-08	8.E-15	6.E-09	4.E-08	2E-19	6E-26	4E-20	3E-19	9.E-19	2.E-25	2.E-19	1.E-18
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	6E-10	1E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	4E-08	2E-13	2E-09	4E-08	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-10	1E-13	2E-09	2E-09	0.E+00	0.E+00	0.E+00	0.E+00	5E-09	1E-13	1E-09	7E-09	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09
U-238	0.22	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	4.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	8.E-09	2.E-14	4.E-10	9.E-09
				Excess Cancer Risk		**6.E-06**	**1.E-10**	**1.E-08**	**6.E-06**			**Excess Cancer Risk**		**1.E-08**	**3.E-14**	**5.E-10**	**1.E-08**

Table D-5-7: Radiological Risk Assessment For Youth Trespasser - EA L1 Plus L2

		T=0 Year								T=1000 Year							
Nuclide	EPC	RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
	pCi/g	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	3E-13	7E-12	3E-12	1E-11	2.E-11	4.E-10	2.E-10	6.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	1E-06	5E-16	6E-10	1E-06	3.E-06	2.E-15	2.E-09	3.E-06	7E-17	4E-26	4E-20	7E-17	3.E-16	1.E-25	2.E-19	3.E-16
H-3	4.7	0E+00	4E-10	3E-13	4E-10	0.E+00	2.E-09	2.E-12	2.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	3E-17	2E-11	2E-11	0.E+00	1.E-14	6.E-09	6.E-09	0E+00	1E-20	8E-15	8E-15	0.E+00	6.E-18	3.E-12	3.E-12
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	4E-12	7E-17	1E-10	1E-10	6.E-12	1.E-16	2.E-10	2.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	3E-06	2E-15	5E-10	3E-06	2.E-05	1.E-14	4.E-09	2.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	8E-09	2E-15	1E-09	9E-09	2.E-08	4.E-15	3.E-09	2.E-08	2E-19	6E-26	4E-20	3E-19	4.E-19	1.E-25	9.E-20	5.E-19
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	6E-10	1E-13	2E-09	2E-09	9.E-10	2.E-13	2.E-09	3.E-09	4E-08	2E-13	2E-09	4E-08	6.E-08	3.E-13	3.E-09	6.E-08
U-234	0.25	1E-10	1E-13	2E-09	2E-09	3.E-11	3.E-14	4.E-10	4.E-10	5E-09	1E-13	1E-09	7E-09	1.E-09	3.E-14	4.E-10	2.E-09
U-235	0.01	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09
U-238	0.23	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	5.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	9.E-09	2.E-14	4.E-10	9.E-09
				Excess Cancer Risk		**3.E-05**	**2.E-09**	**2.E-08**	**3.E-05**			**Excess Cancer Risk**		**7.E-08**	**4.E-13**	**4.E-09**	**8.E-08**

Table D-5-8: Radiological Risk Assessment For Youth Trespasser - EA P

Nuclide	EPC	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
	pCi/g	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	2.2	1E-08	2E-13	2E-09	1E-08	3.E-08	4.E-13	5.E-09	3.E-08	2E-09	4E-14	4E-10	3E-09	5.E-09	8.E-14	9.E-10	6.E-09
C-14	0	3E-13	7E-12	3E-12	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	3E-06	3E-16	2E-10	3E-06	3.E-06	3.E-16	2.E-10	3.E-06	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	1E-06	5E-16	6E-10	1E-06	3.E-05	2.E-14	2.E-08	3.E-05	7E-17	4E-26	4E-20	7E-17	2.E-15	1.E-24	1.E-18	2.E-15
H-3	308	0E+00	4E-10	3E-13	4E-10	0.E+00	1.E-07	1.E-10	1.E-07	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	3E-09	8E-16	5E-09	8E-09	2.E-09	6.E-16	4.E-09	6.E-09	2E-13	5E-20	3E-13	5E-13	1.E-13	4.E-20	3.E-13	4.E-13
Ni-63	85	0E+00	3E-17	2E-11	2E-11	0.E+00	2.E-15	1.E-09	1.E-09	0E+00	1E-20	8E-15	8E-15	0.E+00	1.E-18	7.E-13	7.E-13
Np-237	1.5	3E-07	1E-13	2E-09	3E-07	5.E-07	2.E-13	2.E-09	5.E-07	3E-07	1E-13	1E-09	3E-07	5.E-07	2.E-13	2.E-09	5.E-07
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	9E-11	3E-13	3E-09	3E-09	9.E-10	3.E-12	3.E-08	3.E-08	8E-11	3E-13	3E-09	3E-09	8.E-10	3.E-12	3.E-08	3.E-08
Pu-241	39.9	6E-11	5E-15	4E-11	1E-10	3.E-09	2.E-13	2.E-09	4.E-09	8E-11	1E-15	1E-11	9E-11	3.E-09	5.E-14	6.E-10	4.E-09
Se-79	4.6	4E-12	7E-17	1E-10	1E-10	2.E-11	3.E-16	6.E-10	6.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	3E-06	2E-15	5E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	8E-09	2E-15	1E-09	9E-09	6.E-07	2.E-13	1.E-07	7.E-07	2E-19	6E-26	4E-20	3E-19	2.E-17	5.E-24	4.E-18	2.E-17
Tc-99	24	3E-11	1E-16	5E-11	8E-11	6.E-10	3.E-15	1.E-09	2.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	6E-10	1E-13	2E-09	2E-09	1.E-09	3.E-13	3.E-09	4.E-09	4E-08	2E-13	2E-09	4E-08	8.E-08	4.E-13	4.E-09	8.E-08
U-234	0.72	1E-10	1E-13	2E-09	2E-09	8.E-11	1.E-13	1.E-09	1.E-09	5E-09	1E-13	1E-09	7E-09	4.E-09	8.E-14	1.E-09	5.E-09
U-235	0.025	2E-07	1E-13	2E-09	2E-07	6.E-09	3.E-15	4.E-11	6.E-09	2E-07	1E-13	2E-09	2E-07	5.E-09	3.E-15	4.E-11	5.E-09
U-238	0.52	5E-08	1E-13	2E-09	5E-08	2.E-08	6.E-14	1.E-09	3.E-08	4E-08	1E-13	2E-09	4E-08	2.E-08	5.E-14	9.E-10	2.E-08
				Excess Cancer Risk		**4.E-05**	**1.E-07**	**2.E-07**	**4.E-05**			**Excess Cancer Risk**		**6.E-07**	**4.E-12**	**4.E-08**	**6.E-07**

Table D-5-9: Radiological Risk Assessment For Youth Trespasser - EA R

Nuclide	EPC	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
	pCi/g	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-13	7E-12	3E-12	1E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	1E-06	5E-16	6E-10	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	7E-17	4E-26	4E-20	7E-17	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	4E-10	3E-13	4E-10	0.E+00	1.E-09	8.E-13	1.E-09	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-07	1E-13	2E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	3E-07	1E-13	1E-09	3E-07	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	4E-12	7E-17	1E-10	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	3E-06	2E-15	5E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	8E-09	2E-15	1E-09	9E-09	3.E-09	7.E-16	5.E-10	3.E-09	2E-19	6E-26	4E-20	3E-19	8.E-20	2.E-26	2.E-20	1.E-19
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	6E-10	1E-13	2E-09	2E-09	1.E-09	3.E-13	4.E-09	5.E-09	4E-08	2E-13	2E-09	4E-08	1.E-07	5.E-13	5.E-09	1.E-07
U-234	0.22	1E-10	1E-13	2E-09	2E-09	2.E-11	3.E-14	4.E-10	4.E-10	5E-09	1E-13	1E-09	7E-09	1.E-09	3.E-14	3.E-10	2.E-09
U-235	0.01	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	2.E-11	2.E-09
U-238	0.22	5E-08	1E-13	2E-09	5E-08	1.E-08	3.E-14	4.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	8.E-09	2.E-14	4.E-10	9.E-09
				Excess Cancer Risk		**2.E-08**	**1.E-09**	**5.E-09**	**2.E-08**			**Excess Cancer Risk**		**1.E-07**	**5.E-13**	**6.E-09**	**1.E-07**

Table D-5-10: Radiological Risk Assessment For Youth Trespasser - EA U

Nuclide	EPC pCi/g	T=0 Year								T=1000 Year							
		RSR (1/(pCi/g)				**Risk (unitless)**				RSR (1/(pCi/g)				**Risk (unitless)**			
		Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	**Total**	Ground	Inhalation	Soil	Total	Ground	Inhalation	Soil	Total
Am-241	0	1E-08	2E-13	2E-09	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	2E-09	4E-14	4E-10	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	3E-13	7E-12	3E-12	1E-11	6.E-13	1.E-11	6.E-12	2.E-11	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	3E-06	3E-16	2E-10	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	1E-06	5E-16	6E-10	1E-06	2.E-06	1.E-15	1.E-09	2.E-06	7E-17	4E-26	4E-20	7E-17	2.E-16	8.E-26	9.E-20	2.E-16
H-3	0	0E+00	4E-10	3E-13	4E-10	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-09	8E-16	5E-09	8E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-13	5E-20	3E-13	5E-13	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-17	2E-11	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	1E-20	8E-15	8E-15	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	3E-07	1E-13	2E-09	3E-07	2.E-07	9.E-14	9.E-10	2.E-07	3E-07	1E-13	1E-09	3E-07	2.E-07	8.E-14	9.E-10	2.E-07
Pu-238	0	3E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	2E-12	1E-16	1E-12	3E-12	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	3E-13	3E-09	3E-09	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	6E-11	5E-15	4E-11	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	8E-11	1E-15	1E-11	9E-11	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	4E-12	7E-17	1E-10	1E-10	1.E-11	2.E-16	3.E-10	3.E-10	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	3E-06	2E-15	5E-10	3E-06	2.E-05	1.E-14	3.E-09	2.E-05	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	8E-09	2E-15	1E-09	9E-09	3.E-08	8.E-15	6.E-09	4.E-08	2E-19	6E-26	4E-20	3E-19	9.E-19	3.E-25	2.E-19	1.E-18
Tc-99	0	3E-11	1E-16	5E-11	8E-11	0.E+00	0.E+00	0.E+00	0.E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	6E-10	1E-13	2E-09	2E-09	1.E-09	3.E-13	3.E-09	5.E-09	4E-08	2E-13	2E-09	4E-08	8.E-08	4.E-13	5.E-09	9.E-08
U-234	0.31	1E-10	1E-13	2E-09	2E-09	3.E-11	4.E-14	5.E-10	5.E-10	5E-09	1E-13	1E-09	7E-09	2.E-09	4.E-14	4.E-10	2.E-09
U-235	0.0089	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09	2E-07	1E-13	2E-09	2E-07	2.E-09	1.E-15	1.E-11	2.E-09
U-238	0.21	5E-08	1E-13	2E-09	5E-08	1.E-08	2.E-14	4.E-10	1.E-08	4E-08	1E-13	2E-09	4E-08	8.E-09	2.E-14	3.E-10	8.E-09
				Excess Cancer Risk		**2.E-05**	**1.E-11**	**2.E-08**	**2.E-05**			**Excess Cancer Risk**		**3.E-07**	**6.E-13**	**6.E-09**	**3.E-07**

Table D-5-11: Maximum Risk Assessment Results for Youth Trespasser

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Radiological COPCs										
External Gamma	1.E-04	2.E-04	6.E-05	1.E-05	2.E-05	6.E-06	3.E-05	4.E-05	1.E-07	2.E-05
Inhalation	3.E-11	1.E-13	4.E-13	9.E-11	3.E-08	1.E-10	2.E-09	1.E-07	5.E-13	1.E-11
Soil Ingestion	6.E-08	4.E-08	2.E-08	7.E-09	8.E-09	1.E-08	2.E-08	2.E-07	6.E-09	2.E-08
ELCR	**1.1E-04**	**2.E-04**	6E-05	1E-05	2E-05	6E-06	3E-05	4E-05	1.E-07	2E-05
Major Risk Contributors	Cs-137; Sn-126	Cs-137; Sn-127	None							

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR YOUTH TRESPASSER RECEPTOR

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   1
 Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
```

Table of Contents

Part III: Intake Quantities and Health Risk Factors


```
 Cancer Risk Slope Factors ...............................    2
 Risk Slope and ETFG for the Ground Pathway ..............    6
 Amount of Intake Quantities and Excess Cancer Risks
      Time= 0.000E+00 ....................................    8
      Time= 1.000E+00 ....................................   13
      Time= 3.000E+00 ....................................   18
      Time= 1.000E+01 ....................................   23
      Time= 3.000E+01 ....................................   28
      Time= 1.000E+02 ....................................   33
      Time= 3.000E+02 ....................................   38
      Time= 1.000E+03 ....................................   43
```

```
RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   2
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   3
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   4
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

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Sf-3   U-235+D                                                    9.76E-11   9.44E-11   SLPF( 26,5)
Sf-3   U-238                                                      8.66E-11   8.66E-11   SLPF( 27,5)
Sf-3   U-238+D                                                    1.21E-10   8.66E-11   SLPF( 28,5)

Sf-Rn  Radon Inhalation slope factors, 1/(pCi):
Sf-Rn  Rn-222                                                     1.80E-12   1.80E-12   SLPFRN(1,1)
Sf-Rn  Po-218                                                     3.70E-12   3.70E-12   SLPFRN(1,2)
Sf-Rn  Pb-214                                                     6.20E-12   6.20E-12   SLPFRN(1,3)
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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   5
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)
Sf-Rn	Radon K factors, (mrem/WLM):			
Sf-Rn	Rn-222 Indoor	7.60E+02	7.60E+02	KFACTR(1,1)
Sf-Rn	Rn-222 Outdoor	5.70E+02	5.70E+02	KFACTR(1,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   6
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	6.111E-02	6.111E-02	6.111E-02	6.111E-02	6.111E-02	6.111E-02	6.111E-02	6.111E-02
Ac-227	3.480E-10	6.125E-02	6.125E-02	6.125E-02	6.125E-02	6.125E-02	6.125E-02	6.125E-02	6.125E-02
Am-241	2.760E-08	6.151E-02	6.151E-02	6.151E-02	6.151E-02	6.151E-02	6.151E-02	6.151E-02	6.151E-02
At-217	1.320E-09	5.963E-02	5.963E-02	5.963E-02	5.963E-02	5.963E-02	5.963E-02	5.963E-02	5.963E-02
At-218	3.570E-09	6.149E-02	6.149E-02	6.149E-02	6.149E-02	6.149E-02	6.149E-02	6.149E-02	6.149E-02
Ba-137m	2.690E-06	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02
Bi-210	2.760E-09	6.015E-02	6.015E-02	6.015E-02	6.015E-02	6.015E-02	6.015E-02	6.015E-02	6.015E-02
Bi-211	1.880E-07	6.017E-02	6.017E-02	6.017E-02	6.017E-02	6.017E-02	6.017E-02	6.017E-02	6.017E-02
Bi-213	5.650E-07	5.968E-02	5.968E-02	5.968E-02	5.968E-02	5.968E-02	5.968E-02	5.968E-02	5.968E-02
Bi-214	7.480E-06	5.981E-02	5.981E-02	5.981E-02	5.981E-02	5.981E-02	5.981E-02	5.981E-02	5.981E-02
C-14	7.830E-12	6.196E-02	6.196E-02	6.196E-02	6.196E-02	6.196E-02	6.196E-02	6.196E-02	6.196E-02
Co-60	1.240E-05	5.978E-02	5.978E-02	5.978E-02	5.978E-02	5.978E-02	5.978E-02	5.978E-02	5.978E-02
Cs-137	5.320E-10	6.074E-02	6.074E-02	6.074E-02	6.074E-02	6.074E-02	6.074E-02	6.074E-02	6.074E-02
Fr-221	1.110E-07	6.073E-02	6.073E-02	6.073E-02	6.073E-02	6.073E-02	6.073E-02	6.073E-02	6.073E-02
Fr-223	1.400E-07	6.052E-02	6.052E-02	6.052E-02	6.052E-02	6.052E-02	6.052E-02	6.052E-02	6.052E-02
H-3	0.000E+00	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02
I-129	6.100E-09	6.307E-02	6.307E-02	6.307E-02	6.307E-02	6.307E-02	6.307E-02	6.307E-02	6.307E-02
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	6.131E-02	6.131E-02	6.131E-02	6.131E-02	6.131E-02	6.131E-02	6.131E-02	6.131E-02
Pa-231	1.390E-07	6.020E-02	6.020E-02	6.020E-02	6.020E-02	6.020E-02	6.020E-02	6.020E-02	6.020E-02
Pa-233	7.430E-07	6.028E-02	6.028E-02	6.028E-02	6.028E-02	6.028E-02	6.028E-02	6.028E-02	6.028E-02
Pa-234	8.710E-06	5.976E-02	5.976E-02	5.976E-02	5.976E-02	5.976E-02	5.976E-02	5.976E-02	5.976E-02
Pa-234m	6.870E-08	5.969E-02	5.969E-02	5.969E-02	5.969E-02	5.969E-02	5.969E-02	5.969E-02	5.969E-02
Pb-209	5.370E-10	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02
Pb-210	1.410E-09	6.203E-02	6.203E-02	6.203E-02	6.203E-02	6.203E-02	6.203E-02	6.203E-02	6.203E-02
Pb-211	2.290E-07	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02
Pb-214	9.820E-07	6.016E-02	6.016E-02	6.016E-02	6.016E-02	6.016E-02	6.016E-02	6.016E-02	6.016E-02
Po-210	3.950E-11	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02
Po-211	3.580E-08	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02	5.930E-02
Po-215	7.480E-10	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02
Po-218	4.260E-11	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02
Pu-238	7.220E-11	6.430E-02	6.430E-02	6.430E-02	6.430E-02	6.430E-02	6.430E-02	6.430E-02	6.430E-02
Pu-239	2.000E-10	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02
Pu-241	4.110E-12	6.130E-02	6.130E-02	6.130E-02	6.130E-02	6.130E-02	6.130E-02	6.130E-02	6.130E-02
Ra-223	4.340E-07	6.051E-02	6.051E-02	6.051E-02	6.051E-02	6.051E-02	6.051E-02	6.051E-02	6.051E-02
Ra-225	5.910E-09	6.194E-02	6.194E-02	6.194E-02	6.194E-02	6.194E-02	6.194E-02	6.194E-02	6.194E-02
Ra-226	2.290E-08	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02	6.096E-02
Rn-219	2.250E-07	6.023E-02	6.023E-02	6.023E-02	6.023E-02	6.023E-02	6.023E-02	6.023E-02	6.023E-02
Rn-222	1.740E-09	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02
Sb-126	1.280E-05	5.929E-02	5.929E-02	5.929E-02	5.929E-02	5.929E-02	5.929E-02	5.929E-02	5.929E-02
Sb-126m	6.940E-06	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02	5.936E-02

Se-79	1.100E-11	6.145E-02	6.145E-02	6.145E-02	6.145E-02	6.145E-02	6.145E-02	6.145E-02	6.145E-02
Sn-126	9.960E-08	6.138E-02	6.138E-02	6.138E-02	6.138E-02	6.138E-02	6.138E-02	6.138E-02	6.138E-02
Sr-90	4.820E-10	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02
Tc-99	8.140E-11	6.127E-02	6.127E-02	6.127E-02	6.127E-02	6.127E-02	6.127E-02	6.127E-02	6.127E-02
Th-227	3.780E-07	6.076E-02	6.076E-02	6.076E-02	6.076E-02	6.076E-02	6.076E-02	6.076E-02	6.076E-02
Th-229	2.250E-07	6.115E-02	6.115E-02	6.115E-02	6.115E-02	6.115E-02	6.115E-02	6.115E-02	6.115E-02
Th-230	8.190E-10	6.120E-02	6.120E-02	6.120E-02	6.120E-02	6.120E-02	6.120E-02	6.120E-02	6.120E-02

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   7
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	6.136E-02	6.136E-02	6.136E-02	6.136E-02	6.136E-02	6.136E-02	6.136E-02	6.136E-02
Th-234	1.630E-08	6.133E-02	6.133E-02	6.133E-02	6.133E-02	6.133E-02	6.133E-02	6.133E-02	6.133E-02
Tl-207	1.520E-08	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02
Tl-209	9.830E-06	6.002E-02	6.002E-02	6.002E-02	6.002E-02	6.002E-02	6.002E-02	6.002E-02	6.002E-02
Tl-210	0.000E+00	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02	6.600E-02
U-233	9.820E-10	6.104E-02	6.104E-02	6.104E-02	6.104E-02	6.104E-02	6.104E-02	6.104E-02	6.104E-02
U-234	2.520E-10	6.180E-02	6.180E-02	6.180E-02	6.180E-02	6.180E-02	6.180E-02	6.180E-02	6.180E-02
U-235	5.180E-07	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02	6.094E-02
U-237	3.760E-07	6.097E-02	6.097E-02	6.097E-02	6.097E-02	6.097E-02	6.097E-02	6.097E-02	6.097E-02
U-238	4.990E-11	6.408E-02	6.408E-02	6.408E-02	6.408E-02	6.408E-02	6.408E-02	6.408E-02	6.408E-02
Y-90	1.910E-08	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02	5.967E-02

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 8
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
C-14	5.986E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Co-60	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Cs-137	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
H-3	5.028E+02	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
I-129	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Ni-63	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Np-237	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pu-239	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pu-241	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Sn-126	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Sr-90	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Tc-99	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
U-234	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
U-235	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
U-238	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page   9
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.222E-12	0.0000	5.553E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.724E-14	0.0000
Am-241	1.188E-08	0.0015	1.890E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.258E-09	0.0003
C-14	3.361E-13	0.0000	7.340E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.338E-12	0.0000
Co-60	3.389E-06	0.4372	3.311E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.456E-10	0.0000
Cs-137	9.747E-07	0.1257	5.186E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.819E-10	0.0001
H-3	0.000E+00	0.0000	4.055E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.287E-13	0.0000
I-129	2.604E-09	0.0003	7.763E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.250E-09	0.0007
Ni-63	0.000E+00	0.0000	2.820E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-11	0.0000
Np-237	3.365E-07	0.0434	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0002
Pa-231	4.333E-12	0.0000	2.829E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.819E-13	0.0000
Pb-210	2.968E-18	0.0000	2.558E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.623E-17	0.0000
Pu-238	3.161E-11	0.0000	2.548E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-09	0.0004
Pu-239	8.532E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0004
Pu-241	4.834E-12	0.0000	3.689E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.264E-11	0.0000
Ra-226	1.131E-13	0.0000	4.512E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.761E-16	0.0000
Se-79	3.514E-12	0.0000	7.416E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.213E-10	0.0000
Sn-126	2.726E-06	0.3516	1.539E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.911E-10	0.0001
Sr-90	7.527E-09	0.0010	2.000E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.478E-09	0.0002
Tc-99	2.593E-11	0.0000	1.420E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.009E-11	0.0000
Th-229	1.623E-10	0.0000	3.808E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.988E-12	0.0000
Th-230	1.105E-14	0.0000	5.373E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.319E-14	0.0000
U-233	4.192E-10	0.0001	1.419E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.633E-09	0.0002
U-234	1.089E-10	0.0000	1.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.609E-09	0.0002
U-235	2.313E-07	0.0298	1.254E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.645E-09	0.0002
U-238	4.764E-08	0.0061	1.185E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-09	0.0003
Total	7.728E-06	0.9968	4.142E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.469E-08	0.0032

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 10
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.279E-12	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.0018
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.390E-06	0.4372
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.753E-07	0.1258
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.058E-10	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.854E-09	0.0010
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0436
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.615E-12	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.920E-17	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.804E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-09	0.0004
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.747E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-13	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.726E-06	0.3516
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.005E-09	0.0012
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.602E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.663E-10	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.425E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.052E-09	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.330E-07	0.0300
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.968E-08	0.0064
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.753E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 11
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.182E-08	0.0015	1.881E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.247E-09	0.0003
C-14	3.361E-13	0.0000	7.340E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.338E-12	0.0000
Co-60	3.389E-06	0.4372	3.311E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.456E-10	0.0000
Cs-137	9.747E-07	0.1257	5.186E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.819E-10	0.0001
H-3	0.000E+00	0.0000	4.055E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.287E-13	0.0000
I-129	2.604E-09	0.0003	7.763E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.250E-09	0.0007
Ni-63	0.000E+00	0.0000	2.820E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-11	0.0000
Np-237	3.365E-07	0.0434	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0002
Pu-238	3.161E-11	0.0000	2.548E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-09	0.0004
Pu-239	8.532E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0004
Pu-241	6.440E-11	0.0000	4.637E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.396E-11	0.0000
Se-79	3.514E-12	0.0000	7.416E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.213E-10	0.0000
Sn-126	2.726E-06	0.3516	1.539E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.911E-10	0.0001
Sr-90	7.527E-09	0.0010	2.000E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.478E-09	0.0002
Tc-99	2.593E-11	0.0000	1.420E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.009E-11	0.0000
U-233	5.815E-10	0.0001	1.423E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.637E-09	0.0002
U-234	1.091E-10	0.0000	1.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.609E-09	0.0002
U-235	2.313E-07	0.0298	1.254E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-09	0.0002
U-238	4.764E-08	0.0061	1.185E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-09	0.0003
Total	7.728E-06	0.9968	4.142E-10	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.469E-08	0.0032

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 12
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-08	0.0018
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-11	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.390E-06	0.4372
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.753E-07	0.1258
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.058E-10	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.854E-09	0.0010
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.562E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0436
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.804E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-09	0.0004
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.084E-10	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.726E-06	0.3516
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.005E-09	0.0012
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.602E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.218E-09	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.330E-07	0.0300
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.968E-08	0.0064
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.753E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 13
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.388E-13	0.000E+00	0.000E+00	0.000E+00	8.025E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.025E-07
Am-241	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
C-14	1.414E+00	0.000E+00	0.000E+00	0.000E+00	5.690E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.690E-01
Co-60	6.284E-07	0.000E+00	0.000E+00	0.000E+00	2.112E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.112E+00
Cs-137	7.004E-07	0.000E+00	0.000E+00	0.000E+00	2.353E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.353E+00
H-3	1.752E+02	0.000E+00	0.000E+00	0.000E+00	8.393E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.393E-01
I-129	7.100E-07	0.000E+00	0.000E+00	0.000E+00	2.386E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.386E+00
Ni-63	7.115E-07	0.000E+00	0.000E+00	0.000E+00	2.391E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.391E+00
Np-237	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pa-231	1.517E-11	0.000E+00	0.000E+00	0.000E+00	5.096E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.096E-05
Pb-210	1.437E-17	0.000E+00	0.000E+00	0.000E+00	4.828E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.828E-11
Pu-238	7.112E-07	0.000E+00	0.000E+00	0.000E+00	2.390E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.390E+00
Pu-239	7.169E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pu-241	6.832E-07	0.000E+00	0.000E+00	0.000E+00	2.296E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.296E+00
Ra-226	1.398E-15	0.000E+00	0.000E+00	0.000E+00	4.696E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.696E-09
Se-79	6.554E-07	0.000E+00	0.000E+00	0.000E+00	2.202E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.202E+00
Sn-126	6.554E-07	0.000E+00	0.000E+00	0.000E+00	2.202E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.202E+00
Sr-90	6.997E-07	0.000E+00	0.000E+00	0.000E+00	2.351E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.351E+00
Tc-99	6.554E-07	0.000E+00	0.000E+00	0.000E+00	2.202E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.202E+00
Th-229	6.769E-11	0.000E+00	0.000E+00	0.000E+00	2.275E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.275E-04
Th-230	6.453E-12	0.000E+00	0.000E+00	0.000E+00	2.168E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.168E-05
U-233	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
U-234	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
U-235	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
U-238	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page  14
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.761E-12	0.0000	8.207E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.460E-14	0.0000
Am-241	1.187E-08	0.0017	1.890E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.257E-09	0.0003
C-14	7.936E-14	0.0000	1.733E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.881E-13	0.0000
Co-60	2.971E-06	0.4198	2.902E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.153E-10	0.0000
Cs-137	9.523E-07	0.1345	5.066E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.685E-10	0.0001
H-3	0.000E+00	0.0000	1.412E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-13	0.0000
I-129	2.579E-09	0.0004	7.688E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.199E-09	0.0007
Ni-63	0.000E+00	0.0000	2.799E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-11	0.0000
Np-237	3.365E-07	0.0475	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0002
Pa-231	5.570E-12	0.0000	3.636E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.624E-13	0.0000
Pb-210	5.031E-18	0.0000	4.336E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.631E-16	0.0000
Pu-238	3.136E-11	0.0000	2.528E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.750E-09	0.0004
Pu-239	8.531E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0004
Pu-241	4.607E-12	0.0000	3.515E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E-11	0.0000
Ra-226	1.684E-13	0.0000	6.721E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.112E-16	0.0000
Se-79	3.212E-12	0.0000	6.780E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.109E-10	0.0000
Sn-126	2.492E-06	0.3521	1.407E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.490E-10	0.0001
Sr-90	7.347E-09	0.0010	1.953E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.443E-09	0.0002
Tc-99	2.370E-11	0.0000	1.298E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-11	0.0000
Th-229	2.086E-10	0.0000	4.896E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.127E-12	0.0000
Th-230	1.420E-14	0.0000	6.908E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.124E-14	0.0000
U-233	4.192E-10	0.0001	1.419E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-09	0.0002
U-234	1.089E-10	0.0000	1.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.609E-09	0.0002
U-235	2.313E-07	0.0327	1.253E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.645E-09	0.0002
U-238	4.763E-08	0.0067	1.185E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-09	0.0003
Total	7.053E-06	0.9965	1.444E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.448E-08	0.0035

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 15
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.846E-12	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-08	0.0020
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.600E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.971E-06	0.4198
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.528E-07	0.1346
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.778E-09	0.0011
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0478
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.933E-12	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-16	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.782E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-09	0.0004
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.571E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.689E-13	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.492E-06	0.3521
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.789E-09	0.0012
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.950E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-10	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.545E-14	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.052E-09	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-07	0.0329
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.967E-08	0.0070
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.078E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 16
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.180E-08	0.0017	1.878E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.243E-09	0.0003
C-14	7.936E-14	0.0000	1.733E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.881E-13	0.0000
Co-60	2.971E-06	0.4198	2.902E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.153E-10	0.0000
Cs-137	9.523E-07	0.1345	5.066E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.685E-10	0.0001
H-3	0.000E+00	0.0000	1.412E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-13	0.0000
I-129	2.579E-09	0.0004	7.688E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.199E-09	0.0007
Ni-63	0.000E+00	0.0000	2.799E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-11	0.0000
Np-237	3.365E-07	0.0475	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0002
Pu-238	3.136E-11	0.0000	2.528E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.750E-09	0.0004
Pu-239	8.531E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0004
Pu-241	7.985E-11	0.0000	4.713E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.541E-11	0.0000
Se-79	3.212E-12	0.0000	6.780E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.109E-10	0.0000
Sn-126	2.492E-06	0.3521	1.407E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.490E-10	0.0001
Sr-90	7.347E-09	0.0010	1.953E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.443E-09	0.0002
Tc-99	2.370E-11	0.0000	1.298E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-11	0.0000
U-233	6.278E-10	0.0001	1.424E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.638E-09	0.0002
U-234	1.091E-10	0.0000	1.394E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.609E-09	0.0002
U-235	2.313E-07	0.0327	1.254E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.645E-09	0.0002
U-238	4.763E-08	0.0067	1.185E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.032E-09	0.0003
Total	7.053E-06	0.9965	1.444E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.448E-08	0.0035

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 17
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-08	0.0020
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.600E-12	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.971E-06	0.4198
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.528E-07	0.1346
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.778E-09	0.0011
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.550E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0478
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.782E-09	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.019E-09	0.0004
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-10	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E-10	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.492E-06	0.3521
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.789E-09	0.0012
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.950E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.265E-09	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-07	0.0329
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.967E-08	0.0070
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.078E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 18
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.103E-12	0.000E+00	0.000E+00	0.000E+00	7.068E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.068E-06
Am-241	7.166E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
C-14	7.872E-02	0.000E+00	0.000E+00	0.000E+00	3.168E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.168E-02
Co-60	4.829E-07	0.000E+00	0.000E+00	0.000E+00	1.623E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.623E+00
Cs-137	6.685E-07	0.000E+00	0.000E+00	0.000E+00	2.246E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.246E+00
H-3	2.124E+01	0.000E+00	0.000E+00	0.000E+00	1.018E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.018E-01
I-129	6.964E-07	0.000E+00	0.000E+00	0.000E+00	2.340E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.340E+00
Ni-63	7.008E-07	0.000E+00	0.000E+00	0.000E+00	2.355E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.355E+00
Np-237	7.168E-07	0.000E+00	0.000E+00	0.000E+00	2.409E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.409E+00
Pa-231	4.548E-11	0.000E+00	0.000E+00	0.000E+00	1.528E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.528E-04
Pb-210	3.818E-16	0.000E+00	0.000E+00	0.000E+00	1.283E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.283E-09
Pu-238	7.000E-07	0.000E+00	0.000E+00	0.000E+00	2.352E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.352E+00
Pu-239	7.167E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
Pu-241	6.204E-07	0.000E+00	0.000E+00	0.000E+00	2.085E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.085E+00
Ra-226	1.257E-14	0.000E+00	0.000E+00	0.000E+00	4.224E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.224E-08
Se-79	5.478E-07	0.000E+00	0.000E+00	0.000E+00	1.841E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.841E+00
Sn-126	5.478E-07	0.000E+00	0.000E+00	0.000E+00	1.841E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.841E+00
Sr-90	6.666E-07	0.000E+00	0.000E+00	0.000E+00	2.240E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.240E+00
Tc-99	5.478E-07	0.000E+00	0.000E+00	0.000E+00	1.841E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.841E+00
Th-229	2.030E-10	0.000E+00	0.000E+00	0.000E+00	6.822E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.822E-04
Th-230	1.935E-11	0.000E+00	0.000E+00	0.000E+00	6.504E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.504E-05
U-233	7.164E-07	0.000E+00	0.000E+00	0.000E+00	2.407E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.407E+00
U-234	7.165E-07	0.000E+00	0.000E+00	0.000E+00	2.407E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.407E+00
U-235	7.164E-07	0.000E+00	0.000E+00	0.000E+00	2.407E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.407E+00
U-238	7.164E-07	0.000E+00	0.000E+00	0.000E+00	2.407E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.407E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 19
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.912E-12	0.0000	1.536E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.583E-13	0.0000
Am-241	1.186E-08	0.0020	1.888E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.255E-09	0.0004
C-14	4.415E-15	0.0000	9.641E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.385E-14	0.0000
Co-60	2.283E-06	0.3846	2.230E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-10	0.0000
Cs-137	9.089E-07	0.1531	4.835E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.426E-10	0.0001
H-3	0.000E+00	0.0000	1.711E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.387E-14	0.0000
I-129	2.529E-09	0.0004	7.541E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.100E-09	0.0009
Ni-63	0.000E+00	0.0000	2.757E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-11	0.0000
Np-237	3.364E-07	0.0567	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0003
Pa-231	8.043E-12	0.0000	5.251E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.233E-13	0.0000
Pb-210	1.203E-17	0.0000	1.037E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.901E-16	0.0000
Pu-238	3.086E-11	0.0000	2.488E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.707E-09	0.0005
Pu-239	8.530E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0005
Pu-241	4.183E-12	0.0000	3.192E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.824E-11	0.0000
Ra-226	3.206E-13	0.0000	1.279E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.826E-16	0.0000
Se-79	2.685E-12	0.0000	5.667E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.272E-11	0.0000
Sn-126	2.083E-06	0.3508	1.176E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.753E-10	0.0001
Sr-90	6.999E-09	0.0012	1.860E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-09	0.0002
Tc-99	1.981E-11	0.0000	1.085E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.828E-11	0.0000
Th-229	3.013E-10	0.0001	7.070E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.404E-12	0.0000
Th-230	2.051E-14	0.0000	9.976E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.173E-13	0.0000
U-233	4.190E-10	0.0001	1.418E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-09	0.0003
U-234	1.089E-10	0.0000	1.393E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-09	0.0003
U-235	2.312E-07	0.0389	1.253E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.644E-09	0.0003
U-238	4.761E-08	0.0080	1.184E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.031E-09	0.0003
Total	5.912E-06	0.9959	1.860E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.408E-08	0.0041

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 20
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.070E-12	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.412E-08	0.0024
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.283E-06	0.3846
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.094E-07	0.1532
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.712E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.629E-09	0.0013
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0569
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.566E-12	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.021E-16	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-09	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.018E-09	0.0005
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.243E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.214E-13	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.540E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-06	0.3509
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.373E-09	0.0014
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.809E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.087E-10	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.378E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.051E-09	0.0003
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.717E-09	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.328E-07	0.0392
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-08	0.0084
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.936E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 21
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.176E-08	0.0020	1.872E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.235E-09	0.0004
C-14	4.415E-15	0.0000	9.641E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.385E-14	0.0000
Co-60	2.283E-06	0.3846	2.230E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E-10	0.0000
Cs-137	9.089E-07	0.1531	4.835E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.426E-10	0.0001
H-3	0.000E+00	0.0000	1.711E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.387E-14	0.0000
I-129	2.529E-09	0.0004	7.541E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.100E-09	0.0009
Ni-63	0.000E+00	0.0000	2.757E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-11	0.0000
Np-237	3.364E-07	0.0567	1.441E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.535E-09	0.0003
Pu-238	3.086E-11	0.0000	2.488E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.707E-09	0.0005
Pu-239	8.530E-11	0.0000	2.764E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0005
Pu-241	1.085E-10	0.0000	4.853E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.808E-11	0.0000
Se-79	2.685E-12	0.0000	5.667E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.272E-11	0.0000
Sn-126	2.083E-06	0.3508	1.176E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.753E-10	0.0001
Sr-90	6.999E-09	0.0012	1.860E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-09	0.0002
Tc-99	1.981E-11	0.0000	1.085E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.828E-11	0.0000
U-233	7.202E-10	0.0001	1.425E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.639E-09	0.0003
U-234	1.092E-10	0.0000	1.393E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-09	0.0003
U-235	2.312E-07	0.0389	1.254E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.645E-09	0.0003
U-238	4.761E-08	0.0080	1.184E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.031E-09	0.0003
Total	5.912E-06	0.9959	1.860E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.408E-08	0.0041

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 22
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-08	0.0024
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.447E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.283E-06	0.3846
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.094E-07	0.1532
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.712E-11	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.629E-09	0.0013
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.527E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.380E-07	0.0569
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-09	0.0005
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.018E-09	0.0005
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.566E-10	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.540E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.083E-06	0.3509
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.373E-09	0.0014
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.809E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.359E-09	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.718E-09	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.328E-07	0.0392
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-08	0.0084
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.936E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 23
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.170E-11	0.000E+00	0.000E+00	0.000E+00	7.293E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.293E-05
Am-241	7.142E-07	0.000E+00	0.000E+00	0.000E+00	2.400E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.400E+00
C-14	3.144E-06	0.000E+00	0.000E+00	0.000E+00	1.265E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.265E-06
Co-60	1.921E-07	0.000E+00	0.000E+00	0.000E+00	6.453E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.453E-01
Cs-137	5.678E-07	0.000E+00	0.000E+00	0.000E+00	1.908E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.908E+00
H-3	1.302E-02	0.000E+00	0.000E+00	0.000E+00	6.236E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.236E-05
I-129	6.507E-07	0.000E+00	0.000E+00	0.000E+00	2.187E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.187E+00
Ni-63	6.646E-07	0.000E+00	0.000E+00	0.000E+00	2.233E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.233E+00
Np-237	7.166E-07	0.000E+00	0.000E+00	0.000E+00	2.408E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E+00
Pa-231	1.513E-10	0.000E+00	0.000E+00	0.000E+00	5.085E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.085E-04
Pb-210	1.339E-14	0.000E+00	0.000E+00	0.000E+00	4.501E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.501E-08
Pu-238	6.621E-07	0.000E+00	0.000E+00	0.000E+00	2.225E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.225E+00
Pu-239	7.163E-07	0.000E+00	0.000E+00	0.000E+00	2.407E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.407E+00
Pu-241	4.428E-07	0.000E+00	0.000E+00	0.000E+00	1.488E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.488E+00
Ra-226	1.394E-13	0.000E+00	0.000E+00	0.000E+00	4.685E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.685E-07
Se-79	2.924E-07	0.000E+00	0.000E+00	0.000E+00	9.824E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.824E-01
Sn-126	2.924E-07	0.000E+00	0.000E+00	0.000E+00	9.824E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.824E-01
Sr-90	5.626E-07	0.000E+00	0.000E+00	0.000E+00	1.891E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.891E+00
Tc-99	2.924E-07	0.000E+00	0.000E+00	0.000E+00	9.825E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.825E-01
Th-229	6.760E-10	0.000E+00	0.000E+00	0.000E+00	2.271E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.271E-03
Th-230	6.446E-11	0.000E+00	0.000E+00	0.000E+00	2.166E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.166E-04
U-233	7.154E-07	0.000E+00	0.000E+00	0.000E+00	2.404E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.404E+00
U-234	7.154E-07	0.000E+00	0.000E+00	0.000E+00	2.404E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.404E+00
U-235	7.154E-07	0.000E+00	0.000E+00	0.000E+00	2.404E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.404E+00
U-238	7.154E-07	0.000E+00	0.000E+00	0.000E+00	2.404E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.404E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page  24
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

0
0

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.353E-11	0.0000	5.779E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.957E-13	0.0000
Am-241	1.181E-08	0.0034	1.880E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.245E-09	0.0007
C-14	1.758E-19	0.0000	3.839E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-18	0.0000
Co-60	9.080E-07	0.2631	8.870E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.580E-11	0.0000
Cs-137	7.720E-07	0.2237	4.107E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.608E-10	0.0001
H-3	0.000E+00	0.0000	1.046E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.478E-18	0.0000
I-129	2.364E-09	0.0007	7.047E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.765E-09	0.0014
Ni-63	0.000E+00	0.0000	2.614E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-11	0.0000
Np-237	3.363E-07	0.0975	1.440E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.534E-09	0.0004
Pa-231	1.668E-11	0.0000	1.089E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-12	0.0000
Pb-210	8.501E-17	0.0000	7.326E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.756E-15	0.0000
Pu-238	2.919E-11	0.0000	2.353E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.560E-09	0.0007
Pu-239	8.525E-11	0.0000	2.762E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-09	0.0008
Pu-241	2.986E-12	0.0000	2.278E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.016E-11	0.0000
Ra-226	1.287E-12	0.0000	5.135E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.142E-15	0.0000
Se-79	1.433E-12	0.0000	3.024E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.949E-11	0.0000
Sn-126	1.112E-06	0.3221	6.275E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.003E-10	0.0001
Sr-90	5.907E-09	0.0017	1.570E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.160E-09	0.0003
Tc-99	1.057E-11	0.0000	5.791E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.043E-11	0.0000
Th-229	6.251E-10	0.0002	1.467E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.536E-11	0.0000
Th-230	4.257E-14	0.0000	2.070E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.435E-13	0.0000
U-233	4.183E-10	0.0001	1.416E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.629E-09	0.0005
U-234	1.087E-10	0.0000	1.391E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.606E-09	0.0005
U-235	2.308E-07	0.0669	1.251E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.642E-09	0.0005
U-238	4.754E-08	0.0138	1.182E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-09	0.0006
Total	3.428E-06	0.9933	1.385E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.295E-08	0.0067

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 25
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.413E-11	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.405E-08	0.0041
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.761E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.080E-07	0.2632
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.724E-07	0.2239
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.129E-09	0.0021
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.379E-07	0.0979
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.776E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.841E-15	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.589E-09	0.0008
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.016E-09	0.0009
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.314E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.290E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.092E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.112E-06	0.3222
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.067E-09	0.0020
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-11	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.404E-10	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.048E-09	0.0006
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.715E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.325E-07	0.0674
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.957E-08	0.0144
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.451E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 26
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.162E-08	0.0034	1.850E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.210E-09	0.0006
C-14	1.758E-19	0.0000	3.839E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-18	0.0000
Co-60	9.080E-07	0.2631	8.870E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.580E-11	0.0000
Cs-137	7.720E-07	0.2237	4.107E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.608E-10	0.0001
H-3	0.000E+00	0.0000	1.046E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.478E-18	0.0000
I-129	2.364E-09	0.0007	7.047E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.765E-09	0.0014
Ni-63	0.000E+00	0.0000	2.614E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-11	0.0000
Np-237	3.363E-07	0.0975	1.440E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.534E-09	0.0004
Pu-238	2.920E-11	0.0000	2.353E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.560E-09	0.0007
Pu-239	8.525E-11	0.0000	2.762E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-09	0.0008
Pu-241	1.888E-10	0.0001	5.236E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.549E-11	0.0000
Se-79	1.433E-12	0.0000	3.024E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.949E-11	0.0000
Sn-126	1.112E-06	0.3221	6.275E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.003E-10	0.0001
Sr-90	5.907E-09	0.0017	1.570E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.160E-09	0.0003
Tc-99	1.057E-11	0.0000	5.791E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.043E-11	0.0000
U-233	1.043E-09	0.0003	1.431E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.645E-09	0.0005
U-234	1.100E-10	0.0000	1.391E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.606E-09	0.0005
U-235	2.309E-07	0.0669	1.253E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.643E-09	0.0005
U-238	4.754E-08	0.0138	1.182E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-09	0.0006
Total	3.428E-06	0.9933	1.385E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.295E-08	0.0067

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 27
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.383E-08	0.0040
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.761E-18	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.080E-07	0.2632
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.724E-07	0.2239
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.129E-09	0.0021
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.379E-07	0.0979
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.589E-09	0.0008
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.016E-09	0.0009
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.443E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.092E-11	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.112E-06	0.3222
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.067E-09	0.0020
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.100E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.688E-09	0.0008
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.716E-09	0.0005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.325E-07	0.0674
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.957E-08	0.0144
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.451E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 28
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.604E-10	0.000E+00	0.000E+00	0.000E+00	5.390E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.390E-04
Am-241	6.998E-07	0.000E+00	0.000E+00	0.000E+00	2.352E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.352E+00
C-14	7.177E-19	0.000E+00	0.000E+00	0.000E+00	2.888E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.888E-19
Co-60	1.378E-08	0.000E+00	0.000E+00	0.000E+00	4.631E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.631E-02
Cs-137	3.561E-07	0.000E+00	0.000E+00	0.000E+00	1.197E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.197E+00
H-3	7.738E-12	0.000E+00	0.000E+00	0.000E+00	3.708E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.708E-14
I-129	5.361E-07	0.000E+00	0.000E+00	0.000E+00	1.802E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.802E+00
Ni-63	5.711E-07	0.000E+00	0.000E+00	0.000E+00	1.919E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.919E+00
Np-237	7.160E-07	0.000E+00	0.000E+00	0.000E+00	2.406E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.406E+00
Pa-231	4.520E-10	0.000E+00	0.000E+00	0.000E+00	1.519E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.519E-03
Pb-210	3.124E-13	0.000E+00	0.000E+00	0.000E+00	1.050E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.050E-06
Pu-238	5.647E-07	0.000E+00	0.000E+00	0.000E+00	1.898E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.898E+00
Pu-239	7.151E-07	0.000E+00	0.000E+00	0.000E+00	2.403E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.403E+00
Pu-241	1.689E-07	0.000E+00	0.000E+00	0.000E+00	5.675E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.675E-01
Ra-226	1.248E-12	0.000E+00	0.000E+00	0.000E+00	4.193E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.193E-06
Se-79	4.862E-08	0.000E+00	0.000E+00	0.000E+00	1.634E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.634E-01
Sn-126	4.863E-08	0.000E+00	0.000E+00	0.000E+00	1.634E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.634E-01
Sr-90	3.465E-07	0.000E+00	0.000E+00	0.000E+00	1.164E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.164E+00
Tc-99	4.863E-08	0.000E+00	0.000E+00	0.000E+00	1.634E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.634E-01
Th-229	2.022E-09	0.000E+00	0.000E+00	0.000E+00	6.793E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.793E-03
Th-230	1.930E-10	0.000E+00	0.000E+00	0.000E+00	6.484E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.484E-04
U-233	7.123E-07	0.000E+00	0.000E+00	0.000E+00	2.393E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.393E+00
U-234	7.123E-07	0.000E+00	0.000E+00	0.000E+00	2.394E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.394E+00
U-235	7.123E-07	0.000E+00	0.000E+00	0.000E+00	2.393E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.393E+00
U-238	7.123E-07	0.000E+00	0.000E+00	0.000E+00	2.393E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.393E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page  29
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

0
0

	Water Independent Pathways (Inhalation excludes radon)											
	Ground		Inhalation		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.677E-10	0.0001	2.890E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-12	0.0000
Am-241	1.155E-08	0.0083	1.838E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.196E-09	0.0016
C-14	0.000E+00	0.0000	1.762E-31	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	6.516E-08	0.0470	6.365E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.722E-12	0.0000
Cs-137	4.842E-07	0.3489	2.576E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.891E-10	0.0002
H-3	0.000E+00	0.0000	6.171E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.003E-27	0.0000
I-129	1.947E-09	0.0014	5.806E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-09	0.0028
Ni-63	0.000E+00	0.0000	2.246E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-11	0.0000
Np-237	3.361E-07	0.2422	1.439E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.533E-09	0.0011
Pa-231	4.120E-11	0.0000	2.690E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.681E-12	0.0000
Pb-210	1.069E-15	0.0000	9.216E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.467E-14	0.0000
Pu-238	2.490E-11	0.0000	2.007E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.183E-09	0.0016
Pu-239	8.511E-11	0.0001	2.757E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.926E-09	0.0021
Pu-241	1.139E-12	0.0000	8.690E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.689E-12	0.0000
Ra-226	7.739E-12	0.0000	3.088E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.889E-14	0.0000
Se-79	2.383E-13	0.0000	5.030E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.230E-12	0.0000
Sn-126	1.849E-07	0.1332	1.044E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.331E-11	0.0000
Sr-90	3.638E-09	0.0026	9.669E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.144E-10	0.0005
Tc-99	1.759E-12	0.0000	9.632E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.398E-12	0.0000
Th-229	1.546E-09	0.0011	3.629E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.800E-11	0.0000
Th-230	1.054E-13	0.0000	5.126E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.029E-13	0.0000
U-233	4.165E-10	0.0003	1.410E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.622E-09	0.0012
U-234	1.082E-10	0.0001	1.385E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.599E-09	0.0012
U-235	2.298E-07	0.1656	1.246E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.635E-09	0.0012
U-238	4.734E-08	0.0341	1.177E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-09	0.0015
Total	1.367E-06	0.9850	1.333E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-08	0.0150

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 30
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.707E-10	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.374E-08	0.0099
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.762E-31	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.516E-08	0.0470
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.845E-07	0.3491
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.176E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.873E-09	0.0042
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-07	0.2433
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.388E-11	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.574E-14	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.209E-09	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.011E-09	0.0022
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.829E-12	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.758E-12	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.468E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.849E-07	0.1332
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.352E-09	0.0031
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.157E-12	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.584E-09	0.0011
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.083E-13	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.039E-09	0.0015
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.707E-09	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-07	0.1668
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.935E-08	0.0356
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-06	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years
0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 31
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.125E-08	0.0081	1.790E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.138E-09	0.0015
C-14	0.000E+00	0.0000	1.762E-31	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	6.516E-08	0.0470	6.365E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.722E-12	0.0000
Cs-137	4.842E-07	0.3489	2.576E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.891E-10	0.0002
H-3	0.000E+00	0.0000	6.171E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.003E-27	0.0000
I-129	1.947E-09	0.0014	5.806E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-09	0.0028
Ni-63	0.000E+00	0.0000	2.246E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-11	0.0000
Np-237	3.361E-07	0.2422	1.439E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.533E-09	0.0011
Pu-238	2.491E-11	0.0000	2.007E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.184E-09	0.0016
Pu-239	8.512E-11	0.0001	2.757E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.926E-09	0.0021
Pu-241	3.068E-10	0.0002	5.734E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.579E-11	0.0000
Se-79	2.383E-13	0.0000	5.030E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.230E-12	0.0000
Sn-126	1.849E-07	0.1332	1.044E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.331E-11	0.0000
Sr-90	3.638E-09	0.0026	9.669E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.144E-10	0.0005
Tc-99	1.759E-12	0.0000	9.632E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.398E-12	0.0000
U-233	1.963E-09	0.0014	1.446E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.660E-09	0.0012
U-234	1.161E-10	0.0001	1.385E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.599E-09	0.0012
U-235	2.300E-07	0.1658	1.251E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.640E-09	0.0012
U-238	4.734E-08	0.0341	1.177E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-09	0.0015
Total	1.367E-06	0.9850	1.333E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-08	0.0150

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 32
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-08	0.0096
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.762E-31	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.516E-08	0.0470
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.845E-07	0.3491
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.176E-24	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.873E-09	0.0042
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.244E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.376E-07	0.2433
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.209E-09	0.0016
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.011E-09	0.0022
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.726E-10	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.468E-12	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.849E-07	0.1332
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.352E-09	0.0031
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.157E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-09	0.0026
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.715E-09	0.0012
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.317E-07	0.1669
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.935E-08	0.0356
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.388E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 33
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.030E-09	0.000E+00	0.000E+00	0.000E+00	3.461E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.461E-03
Am-241	6.281E-07	0.000E+00	0.000E+00	0.000E+00	2.111E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.111E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	1.365E-12	0.000E+00	0.000E+00	0.000E+00	4.585E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.585E-06
Cs-137	6.960E-08	0.000E+00	0.000E+00	0.000E+00	2.339E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.339E-01
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	2.722E-07	0.000E+00	0.000E+00	0.000E+00	9.145E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.145E-01
Ni-63	3.359E-07	0.000E+00	0.000E+00	0.000E+00	1.129E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.129E+00
Np-237	7.139E-07	0.000E+00	0.000E+00	0.000E+00	2.399E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.399E+00
Pa-231	1.483E-09	0.000E+00	0.000E+00	0.000E+00	4.983E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.983E-03
Pb-210	7.562E-12	0.000E+00	0.000E+00	0.000E+00	2.541E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.541E-05
Pu-238	3.236E-07	0.000E+00	0.000E+00	0.000E+00	1.087E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.087E+00
Pu-239	7.110E-07	0.000E+00	0.000E+00	0.000E+00	2.389E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.389E+00
Pu-241	5.789E-09	0.000E+00	0.000E+00	0.000E+00	1.945E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.945E-02
Ra-226	1.361E-11	0.000E+00	0.000E+00	0.000E+00	4.572E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.572E-05
Se-79	9.119E-11	0.000E+00	0.000E+00	0.000E+00	3.064E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.064E-04
Sn-126	9.123E-11	0.000E+00	0.000E+00	0.000E+00	3.065E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.065E-04
Sr-90	6.352E-08	0.000E+00	0.000E+00	0.000E+00	2.135E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.135E-01
Tc-99	9.126E-11	0.000E+00	0.000E+00	0.000E+00	3.067E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.067E-04
Th-229	6.666E-09	0.000E+00	0.000E+00	0.000E+00	2.240E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.240E-02
Th-230	6.382E-10	0.000E+00	0.000E+00	0.000E+00	2.144E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.144E-03
U-233	7.016E-07	0.000E+00	0.000E+00	0.000E+00	2.357E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.357E+00
U-234	7.017E-07	0.000E+00	0.000E+00	0.000E+00	2.358E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.358E+00
U-235	7.015E-07	0.000E+00	0.000E+00	0.000E+00	2.357E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.357E+00
U-238	7.015E-07	0.000E+00	0.000E+00	0.000E+00	2.357E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.357E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page  34
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	9.324E-10	0.0013	1.607E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.657E-11	0.0000
Am-241	1.035E-08	0.0140	1.648E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.968E-09	0.0027
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	6.451E-12	0.0000	6.302E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.676E-16	0.0000
Cs-137	9.463E-08	0.1282	5.035E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.649E-11	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.885E-10	0.0013	2.947E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.993E-09	0.0027
Ni-63	0.000E+00	0.0000	1.321E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.318E-12	0.0000
Np-237	3.351E-07	0.4539	1.435E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.529E-09	0.0021
Pa-231	1.253E-10	0.0002	8.179E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.152E-12	0.0000
Pb-210	2.058E-14	0.0000	1.773E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.671E-13	0.0000
Pu-238	1.427E-11	0.0000	1.150E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-09	0.0017
Pu-239	8.461E-11	0.0001	2.741E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.909E-09	0.0039
Pu-241	3.904E-14	0.0000	2.979E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.636E-13	0.0000
Ra-226	7.226E-11	0.0001	2.883E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-13	0.0000
Se-79	4.470E-16	0.0000	9.434E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.544E-14	0.0000
Sn-126	3.468E-10	0.0005	1.958E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.250E-14	0.0000
Sr-90	6.669E-10	0.0009	1.773E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-10	0.0002
Tc-99	3.301E-15	0.0000	1.808E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.377E-15	0.0000
Th-229	4.726E-09	0.0064	1.109E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-10	0.0002
Th-230	3.231E-13	0.0000	1.571E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.848E-12	0.0000
U-233	4.103E-10	0.0006	1.389E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.598E-09	0.0022
U-234	1.066E-10	0.0001	1.364E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-09	0.0021
U-235	2.264E-07	0.3066	1.227E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.610E-09	0.0022
U-238	4.662E-08	0.0632	1.160E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-09	0.0027
Total	7.215E-07	0.9773	1.226E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.676E-08	0.0227

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 35
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.489E-10	0.0013
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.232E-08	0.0167
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.452E-12	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.469E-08	0.1283
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-09	0.0040
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.318E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.366E-07	0.4559
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.334E-10	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.877E-13	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-09	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.994E-09	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-13	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.243E-11	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.588E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.469E-10	0.0005
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.979E-10	0.0011
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.677E-15	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.842E-09	0.0066
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.171E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.008E-09	0.0027
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.682E-09	0.0023
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.280E-07	0.3088
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.861E-08	0.0658
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.383E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 36
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.002E-08	0.0136	1.594E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.903E-09	0.0026
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	6.451E-12	0.0000	6.302E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.676E-16	0.0000
Cs-137	9.463E-08	0.1282	5.035E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.649E-11	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.885E-10	0.0013	2.947E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.993E-09	0.0027
Ni-63	0.000E+00	0.0000	1.321E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.318E-12	0.0000
Np-237	3.351E-07	0.4538	1.435E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.529E-09	0.0021
Pu-238	1.429E-11	0.0000	1.150E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-09	0.0017
Pu-239	8.464E-11	0.0001	2.741E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.909E-09	0.0039
Pu-241	3.425E-10	0.0005	5.478E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.533E-11	0.0001
Se-79	4.470E-16	0.0000	9.434E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.544E-14	0.0000
Sn-126	3.468E-10	0.0005	1.958E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.250E-14	0.0000
Sr-90	6.669E-10	0.0009	1.773E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-10	0.0002
Tc-99	3.301E-15	0.0000	1.808E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.377E-15	0.0000
U-233	5.135E-09	0.0070	1.499E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.713E-09	0.0023
U-234	1.792E-10	0.0002	1.365E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-09	0.0021
U-235	2.274E-07	0.3080	1.251E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.635E-09	0.0022
U-238	4.662E-08	0.0632	1.160E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-09	0.0027
Total	7.215E-07	0.9773	1.226E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.676E-08	0.0227

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 37
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-08	0.0162
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.452E-12	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.469E-08	0.1283
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-09	0.0040
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.318E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.366E-07	0.4559
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.266E-09	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.994E-09	0.0041
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-10	0.0006
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.588E-14	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.469E-10	0.0005
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.979E-10	0.0011
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.677E-15	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.848E-09	0.0093
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.756E-09	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.291E-07	0.3102
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.861E-08	0.0658
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.383E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 38
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.773E-09	0.000E+00	0.000E+00	0.000E+00	1.268E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.268E-02
Am-241	4.510E-07	0.000E+00	0.000E+00	0.000E+00	1.515E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.515E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	4.944E-24	0.000E+00	0.000E+00	0.000E+00	1.661E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.661E-17
Cs-137	6.561E-10	0.000E+00	0.000E+00	0.000E+00	2.204E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.204E-03
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	3.922E-08	0.000E+00	0.000E+00	0.000E+00	1.318E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.318E-01
Ni-63	7.375E-08	0.000E+00	0.000E+00	0.000E+00	2.478E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.478E-01
Np-237	7.079E-07	0.000E+00	0.000E+00	0.000E+00	2.379E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.379E+00
Pa-231	4.251E-09	0.000E+00	0.000E+00	0.000E+00	1.428E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.428E-02
Pb-210	9.423E-11	0.000E+00	0.000E+00	0.000E+00	3.166E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.166E-04
Pu-238	6.594E-08	0.000E+00	0.000E+00	0.000E+00	2.216E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.216E-01
Pu-239	6.993E-07	0.000E+00	0.000E+00	0.000E+00	2.350E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.350E+00
Pu-241	3.775E-13	0.000E+00	0.000E+00	0.000E+00	1.269E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.269E-06
Ra-226	1.161E-10	0.000E+00	0.000E+00	0.000E+00	3.900E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.900E-04
Se-79	1.476E-18	0.000E+00	0.000E+00	0.000E+00	4.958E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.958E-12
Sn-126	1.477E-18	0.000E+00	0.000E+00	0.000E+00	4.964E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.964E-12
Sr-90	4.987E-10	0.000E+00	0.000E+00	0.000E+00	1.676E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.676E-03
Tc-99	1.479E-18	0.000E+00	0.000E+00	0.000E+00	4.969E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.969E-12
Th-229	1.939E-08	0.000E+00	0.000E+00	0.000E+00	6.514E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.514E-02
Th-230	1.872E-09	0.000E+00	0.000E+00	0.000E+00	6.291E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.291E-03
U-233	6.718E-07	0.000E+00	0.000E+00	0.000E+00	2.257E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.257E+00
U-234	6.720E-07	0.000E+00	0.000E+00	0.000E+00	2.258E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.258E+00
U-235	6.718E-07	0.000E+00	0.000E+00	0.000E+00	2.257E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.257E+00
U-238	6.718E-07	0.000E+00	0.000E+00	0.000E+00	2.257E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.257E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 39
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.301E-09	0.0052	5.690E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.866E-11	0.0001
Am-241	7.433E-09	0.0117	1.183E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.413E-09	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.337E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-27	0.0000
Cs-137	8.920E-10	0.0014	4.746E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.325E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.424E-10	0.0002	4.247E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.872E-10	0.0005
Ni-63	0.000E+00	0.0000	2.901E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-12	0.0000
Np-237	3.323E-07	0.5244	1.423E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.516E-09	0.0024
Pa-231	3.511E-10	0.0006	2.292E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.284E-11	0.0000
Pb-210	2.413E-13	0.0000	2.079E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.822E-12	0.0000
Pu-238	2.907E-12	0.0000	2.343E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.549E-10	0.0004
Pu-239	8.322E-11	0.0001	2.696E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-09	0.0045
Pu-241	2.546E-18	0.0000	1.943E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.719E-17	0.0000
Ra-226	5.887E-10	0.0009	2.349E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.437E-12	0.0000
Se-79	7.232E-24	0.0000	1.526E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.498E-22	0.0000
Sn-126	5.616E-18	0.0000	3.170E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-21	0.0000
Sr-90	5.236E-12	0.0000	1.392E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-12	0.0000
Tc-99	5.348E-23	0.0000	2.929E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-22	0.0000
Th-229	1.343E-08	0.0212	3.153E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.301E-10	0.0005
Th-230	9.266E-13	0.0000	4.506E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.300E-12	0.0000
U-233	3.929E-10	0.0006	1.330E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.530E-09	0.0024
U-234	1.021E-10	0.0002	1.307E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.508E-09	0.0024
U-235	2.168E-07	0.3421	1.175E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.542E-09	0.0024
U-238	4.465E-08	0.0705	1.110E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.904E-09	0.0030
Total	6.204E-07	0.9791	1.086E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-08	0.0209

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 40
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.360E-09	0.0053
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.846E-09	0.0140
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.925E-10	0.0014
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.296E-10	0.0007
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.338E-07	0.5268
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.739E-10	0.0006
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.063E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.579E-10	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.945E-09	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.902E-10	0.0009
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.570E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.617E-18	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.265E-12	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.568E-22	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.376E-08	0.0217
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.227E-12	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.923E-09	0.0030
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.611E-09	0.0025
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.183E-07	0.3445
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.655E-08	0.0735
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.336E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 41
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.211E-09	0.0114	1.144E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-09	0.0022
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.337E-23	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-27	0.0000
Cs-137	8.920E-10	0.0014	4.746E-19	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.325E-13	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.424E-10	0.0002	4.247E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.872E-10	0.0005
Ni-63	0.000E+00	0.0000	2.901E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-12	0.0000
Np-237	3.322E-07	0.5243	1.425E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E-09	0.0024
Pu-238	3.044E-12	0.0000	2.348E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.554E-10	0.0004
Pu-239	8.329E-11	0.0001	2.696E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-09	0.0045
Pu-241	2.485E-10	0.0004	3.943E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.709E-11	0.0001
Se-79	7.232E-24	0.0000	1.526E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.498E-22	0.0000
Sn-126	5.616E-18	0.0000	3.170E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-21	0.0000
Sr-90	5.236E-12	0.0000	1.392E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.028E-12	0.0000
Tc-99	5.348E-23	0.0000	2.929E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.033E-22	0.0000
U-233	1.382E-08	0.0218	1.643E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.858E-09	0.0029
U-234	6.916E-10	0.0011	1.310E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.521E-09	0.0024
U-235	2.204E-07	0.3479	1.255E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.623E-09	0.0026
U-238	4.465E-08	0.0705	1.112E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.906E-09	0.0030
Total	6.204E-07	0.9791	1.086E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-08	0.0209

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 42
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.577E-09	0.0135
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-23	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.925E-10	0.0014
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.296E-10	0.0007
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-12	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.338E-07	0.5267
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.585E-10	0.0004
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.945E-09	0.0046
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.955E-10	0.0005
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.570E-22	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.617E-18	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.265E-12	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.568E-22	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.567E-08	0.0247
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.213E-09	0.0035
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.220E-07	0.3504
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.655E-08	0.0735
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.336E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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RESRAD, Version 6.5      T« Limit = 180 days        10/22/2014  10:45  Page  43
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.160E-08	0.000E+00	0.000E+00	0.000E+00	3.897E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.897E-02
Am-241	1.413E-07	0.000E+00	0.000E+00	0.000E+00	4.748E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.748E-01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	5.334E-17	0.000E+00	0.000E+00	0.000E+00	1.792E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.792E-10
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	4.455E-11	0.000E+00	0.000E+00	0.000E+00	1.497E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.497E-04
Ni-63	3.657E-10	0.000E+00	0.000E+00	0.000E+00	1.229E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.229E-03
Np-237	6.872E-07	0.000E+00	0.000E+00	0.000E+00	2.309E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.309E+00
Pa-231	1.209E-08	0.000E+00	0.000E+00	0.000E+00	4.061E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.061E-02
Pb-210	1.011E-09	0.000E+00	0.000E+00	0.000E+00	3.398E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.398E-03
Pu-238	2.518E-10	0.000E+00	0.000E+00	0.000E+00	8.459E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.459E-04
Pu-239	6.598E-07	0.000E+00	0.000E+00	0.000E+00	2.217E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.217E+00
Pu-241	8.453E-28	0.000E+00	0.000E+00	0.000E+00	2.841E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.841E-21
Ra-226	1.074E-09	0.000E+00	0.000E+00	0.000E+00	3.608E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.608E-03
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	2.139E-17	0.000E+00	0.000E+00	0.000E+00	7.187E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.187E-11
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	5.799E-08	0.000E+00	0.000E+00	0.000E+00	1.949E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.949E-01
Th-230	5.777E-09	0.000E+00	0.000E+00	0.000E+00	1.941E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.941E-02
U-233	5.775E-07	0.000E+00	0.000E+00	0.000E+00	1.941E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.941E+00
U-234	5.775E-07	0.000E+00	0.000E+00	0.000E+00	1.940E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.940E+00
U-235	5.773E-07	0.000E+00	0.000E+00	0.000E+00	1.940E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.940E+00
U-238	5.773E-07	0.000E+00	0.000E+00	0.000E+00	1.940E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.940E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 44
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.005E-08	0.0163	1.733E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.786E-10	0.0003
Am-241	2.329E-09	0.0038	3.707E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-10	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	7.252E-17	0.0000	3.858E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.329E-20	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.618E-13	0.0000	4.825E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.263E-13	0.0000
Ni-63	0.000E+00	0.0000	1.439E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.968E-15	0.0000
Np-237	3.225E-07	0.5221	1.381E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-09	0.0024
Pa-231	9.901E-10	0.0016	6.464E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.442E-11	0.0001
Pb-210	2.542E-12	0.0000	2.191E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.242E-11	0.0001
Pu-238	1.110E-14	0.0000	8.948E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.734E-13	0.0000
Pu-239	7.852E-11	0.0001	2.544E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.700E-09	0.0044
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	5.358E-09	0.0087	2.138E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	2.246E-19	0.0000	5.968E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.410E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	3.986E-08	0.0645	9.354E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.796E-10	0.0016
Th-230	2.836E-12	0.0000	1.379E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.622E-11	0.0000
U-233	3.377E-10	0.0005	1.143E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.315E-09	0.0021
U-234	8.775E-11	0.0001	1.123E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-09	0.0021
U-235	1.863E-07	0.3015	1.010E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.325E-09	0.0021
U-238	3.836E-08	0.0621	9.542E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.636E-09	0.0026
Total	6.063E-07	0.9813	9.718E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0187

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 45
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.023E-08	0.0166
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.771E-09	0.0045
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.256E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.881E-13	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.968E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.240E-07	0.5245
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-09	0.0017
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E-11	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.846E-13	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.778E-09	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.371E-09	0.0087
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.686E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.084E-08	0.0661
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.906E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.653E-09	0.0027
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.384E-09	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.876E-07	0.3036
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.000E-08	0.0647
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.178E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 46
Intrisk : Residual Dose and Risk Assessment for Trespasser Youth
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\TRESPASSER_YOUTH.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.303E-09	0.0037	3.586E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.282E-10	0.0007
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	7.252E-17	0.0000	3.858E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.329E-20	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.618E-13	0.0000	4.825E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.263E-13	0.0000
Ni-63	0.000E+00	0.0000	1.439E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.968E-15	0.0000
Np-237	3.226E-07	0.5222	1.388E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-09	0.0024
Pu-238	1.572E-12	0.0000	1.310E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.479E-12	0.0000
Pu-239	7.872E-11	0.0001	2.544E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.700E-09	0.0044
Pu-241	7.930E-11	0.0001	1.236E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.476E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	2.246E-19	0.0000	5.968E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.410E-20	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	4.011E-08	0.0649	2.071E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.286E-09	0.0037
U-234	5.444E-09	0.0088	1.137E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.404E-09	0.0023
U-235	1.973E-07	0.3194	1.247E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.568E-09	0.0025
U-238	3.837E-08	0.0621	9.574E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.640E-09	0.0027
Total	6.063E-07	0.9813	9.718E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-08	0.0187

RESRAD, Version 6.5 T« Limit = 180 days 10/22/2014 10:45 Page 47
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.731E-09	0.0044
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.256E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.881E-13	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.968E-15	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E-07	0.5246
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.051E-12	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.778E-09	0.0045
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.406E-11	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.686E-19	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.239E-08	0.0686
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.848E-09	0.0111
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.989E-07	0.3219
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.001E-08	0.0648
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.178E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-6: Results of Radiological Risk Assessment for CERCLA Residential Receptor

Table D-6-1: Results of Radiological Risk Assessment For EA A Plus B at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Contribution
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0.18	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	4E-08	5E-09	1E-08	8E-11	8E-12	2E-08	0E+00	0E+00	0E+00	8E-08	0%
C-14	3.4	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	6E-12	3E-10	6E-07	8E-08	6E-08	2E-10	0E+00	0E+00	0E+00	7E-07	0%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	27.7	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	4E-04	2E-09	2E-05	9E-06	5E-06	7E-07	0E+00	0E+00	0E+00	5E-04	23%
H-3	0	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0.31	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	5E-10	1E-08	3E-08	4E-10	9E-12	5E-08	0E+00	0E+00	0E+00	9E-08	0%
Pu-241	1.2	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	4E-09	9E-10	2E-09	2E-11	1E-12	3E-09	0E+00	0E+00	0E+00	1E-08	0%
Se-79	2.4	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	9E-11	1E-11	5E-07	8E-07	2E-07	8E-09	4E-06	3E-05	7E-06	4E-05	2%
Sn-126	31.7	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	9E-04	4E-09	7E-07	4E-07	9E-08	4E-07	2E-04	1E-04	4E-05	1E-03	63%
Sr-90	17.1	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	2E-06	4E-09	2E-04	2E-05	1E-05	1E-06	0E+00	0E+00	0E+00	3E-04	12%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	0	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-234	0.26	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	6E-10	5E-09	4E-08	7E-10	3E-09	2E-08	0E+00	0E+00	0E+00	7E-08	0%
U-235	0.0089	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	4E-08	2E-10	1E-09	2E-11	1E-10	7E-10	0E+00	0E+00	0E+00	4E-08	0%
U-238	0.19	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2E-07	3E-09	3E-08	6E-10	3E-09	2E-08	0E+00	0E+00	0E+00	2E-07	0%
											Excess Cancer Risk	**1.E-03**	**4.E-08**	**2.E-04**	**3.E-05**	**2.E-05**	**2.E-06**	**2.E-04**	**2.E-04**	**4.E-05**	**2.E-03**	

Table D-6-2: Results of Radiological Risk Assessment For EA A Plus B at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0.18	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	8.E-09	9.E-10	3.E-09	2.E-11	2.E-12	4.E-09	0.E+00	0.E+00	0.E+00	2.E-08
C-14	3.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	3.E-14	1.E-19	1.E-15	7.E-16	4.E-16	5.E-17	0.E+00	0.E+00	0.E+00	4.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	5.E-10	1.E-08	3.E-08	3.E-10	8.E-12	4.E-08	0.E+00	0.E+00	0.E+00	8.E-08
Pu-241	1.2	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	2.E-09	2.E-10	6.E-10	4.E-12	4.E-13	9.E-10	0.E+00	0.E+00	0.E+00	4.E-09
Se-79	2.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	6.E-17	1.E-19	7.E-15	7.E-16	4.E-16	3.E-17	0.E+00	0.E+00	0.E+00	8.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	3.E-08	4.E-09	4.E-08	8.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	1.E-07
U-235	0.0089	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4.E-08	2.E-10	1.E-09	4.E-11	8.E-11	7.E-10	0.E+00	0.E+00	0.E+00	4.E-08
U-238	0.19	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	1.E-07	3.E-09	3.E-08	5.E-10	2.E-09	2.E-08	0.E+00	0.E+00	0.E+00	2.E-07
											Excess Cancer Risk	**2.E-07**	**2.E-08**	**1.E-07**	**2.E-09**	**5.E-09**	**8.E-08**	**0.E+00**	**0.E+00**	**0.E+00**	**4.E-07**

Table D-6-3: Results of Radiological Risk Assessment For EA C at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalatio	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
C-14	0	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	7.1	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	1E-04	4E-10	5E-06	2E-06	1E-06	2E-07	0E+00	0E+00	0E+00	1E-04	5%
H-3	0	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	4.5	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	2E-11	1E-07	9E-09	8E-08	3E-09	0E+00	0E+00	0E+00	2E-07	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Se-79	0	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Sn-126	53.1	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	2E-03	6E-09	1E-06	6E-07	2E-07	7E-07	4E-04	2E-04	6E-05	2E-03	93%
Sr-90	3	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	4E-07	7E-10	4E-05	4E-06	2E-06	2E-07	0E+00	0E+00	0E+00	5E-05	2%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	0	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-234	0	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-235	0.01	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	6E-08	2E-10	2E-09	3E-11	1E-10	1E-09	0E+00	0E+00	0E+00	6E-08	0%
U-238	0.28	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	3E-07	5E-09	5E-08	9E-10	4E-09	3E-08	0E+00	0E+00	0E+00	4E-07	0%
											Excess Cancer Risk	**2.E-03**	**1.E-08**	**4.E-05**	**7.E-06**	**4.E-06**	**1.E-06**	**4.E-04**	**2.E-04**	**6.E-05**	**2.E-03**	

Table D-6-4: Results of Radiological Risk Assessment For EA C at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalati	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cs-137	7.1	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	8E-15	3E-20	4E-16	2E-16	1E-16	1E-17	0E+00	0E+00	0E+00	9E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Ni-63	4.5	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	9E-15	6E-11	5E-12	4E-11	2E-12	0E+00	0E+00	0E+00	1E-10
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sn-126	53.1	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sr-90	3	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	1E-17	2E-20	1E-15	1E-16	7E-17	5E-18	0E+00	0E+00	0E+00	1E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-233	0	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-234	0	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-235	0.013	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	5E-08	2E-10	2E-09	6E-11	1E-10	1E-09	0E+00	0E+00	0E+00	6E-08
U-238	0.28	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	4E-09	4E-08	7E-10	3E-09	2E-08	0E+00	0E+00	0E+00	3E-07
											Excess Cancer Risk	**3E-07**	**4E-09**	**4E-08**	**8E-10**	**3E-09**	**2E-08**	**0E+00**	**0E+00**	**0E+00**	**3E-07**

Table D-6-5: Results of Radiological Risk Assessment For EA E at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0E+00	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
C-14	0E+00	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Co-60	0E+00	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	5E+00	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	8E-05	3E-10	3E-06	2E-06	9E-07	1E-07	0E+00	0E+00	0E+00	9E-05	9%
H-3	0E+00	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
I-129	0E+00	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	0E+00	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Np-237	0E+00	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-238	0E+00	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0E+00	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-241	0E+00	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Se-79	4E+00	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	1E-10	2E-11	9E-07	1E-06	3E-07	1E-08	7E-06	4E-05	1E-05	6E-05	6%
Sn-126	2E+01	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	5E-04	2E-09	4E-07	2E-07	5E-08	2E-07	1E-04	8E-05	2E-05	8E-04	80%
Sr-90	3E+00	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	3E-07	6E-10	3E-05	3E-06	2E-06	1E-07	0E+00	0E+00	0E+00	4E-05	4%
Tc-99	0E+00	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	2E+00	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	4E-08	4E-08	3E-07	5E-09	2E-08	2E-07	0E+00	0E+00	0E+00	6E-07	0%
U-234	5E-01	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	1E-09	9E-09	6E-08	1E-09	5E-09	4E-08	0E+00	0E+00	0E+00	1E-07	0%
U-235	1E-03	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	6E-09	2E-11	2E-10	3E-12	1E-11	1E-10	0E+00	0E+00	0E+00	6E-09	0%
U-238	3E-01	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	3E-07	5E-09	5E-08	9E-10	4E-09	3E-08	0E+00	0E+00	0E+00	4E-07	0%
											Excess Cancer Risk	**6E-04**	**6E-08**	**4E-05**	**7E-06**	**3E-06**	**7E-07**	**1E-04**	**1E-04**	**3E-05**	**1E-03**	

RPP-RPT-58329, Rev. 3

Table D-6-6: Results of Radiological Risk Assessment For EA E at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0E+00	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
C-14	0E+00	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Co-60	0E+00	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cs-137	5E+00	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	6E-15	2E-20	3E-16	1E-16	7E-17	9E-18	0E+00	0E+00	0E+00	7E-15
H-3	0E+00	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
I-129	0E+00	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Ni-63	0E+00	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Np-237	0E+00	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-238	0E+00	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-239	0E+00	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-241	0E+00	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Se-79	4E+00	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sn-126	2E+01	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sr-90	3E+00	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	9E-18	2E-20	1E-15	1E-16	5E-17	4E-18	0E+00	0E+00	0E+00	1E-15
Tc-99	0E+00	0E+00	0E+00	0E+00	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-233	2E+00	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	2E-06	6E-08	3E-07	5E-09	2E-08	2E-07	0E+00	0E+00	0E+00	2E-06
U-234	5E-01	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	5E-08	7E-09	7E-08	1E-09	5E-09	3E-08	0E+00	0E+00	0E+00	2E-07
U-235	1E-03	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	5E-09	2E-11	2E-10	6E-12	1E-11	9E-11	0E+00	0E+00	0E+00	5E-09
U-238	3E-01	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	4E-09	4E-08	7E-10	3E-09	2E-08	0E+00	0E+00	0E+00	3E-07
				Excess Cancer Risk								**2E-06**	**7E-08**	**4E-07**	**7E-09**	**3E-08**	**3E-07**	**0E+00**	**0E+00**	**0E+00**	**3E-06**

Table D-6-7: Results of Radiological Risk Assessment For EA F Plus G at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
C-14	12.5	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	2E-11	1E-09	2E-06	3E-07	2E-07	6E-10	0E+00	0E+00	0E+00	3E-06	1%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	3.2	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	5E-05	2E-10	2E-06	1E-06	6E-07	8E-08	0E+00	0E+00	0E+00	6E-05	26%
H-3	0	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Se-79	2.4	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	9E-11	1E-11	5E-07	8E-07	2E-07	8E-09	4E-06	3E-05	7E-06	4E-05	18%
Sn-126	2.6	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	7E-05	3E-10	6E-08	3E-08	8E-09	3E-08	2E-05	1E-05	3E-06	1E-04	51%
Sr-90	0.3	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	4E-08	7E-11	4E-06	4E-07	2E-07	2E-08	0E+00	0E+00	0E+00	5E-06	2%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	1.5	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	3E-08	3E-08	2E-07	4E-09	2E-08	1E-07	0E+00	0E+00	0E+00	4E-07	0%
U-234	0.3	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	7E-10	6E-09	4E-08	8E-10	3E-09	2E-08	0E+00	0E+00	0E+00	8E-08	0%
U-235	0.01	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	5E-08	2E-10	1E-09	3E-11	1E-10	8E-10	0E+00	0E+00	0E+00	5E-08	0%
U-238	0.24	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2E-07	4E-09	4E-08	8E-10	3E-09	2E-08	0E+00	0E+00	0E+00	3E-07	0%
											Excess Cancer Risk	**1E-04**	**4E-08**	**9E-06**	**3E-06**	**1E-06**	**3E-07**	**2E-05**	**4E-05**	**1E-05**	**2E-04**	

Table D-6-8: Results of Radiological Risk Assessment For EA F Plus G at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
C-14	12.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cs-137	3.2	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	4E-15	1E-20	2E-16	8E-17	4E-17	6E-18	0E+00	0E+00	0E+00	4E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Se-79	2.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sn-126	2.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sr-90	0.3	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	1E-18	2E-21	1E-16	1E-17	7E-18	5E-19	0E+00	0E+00	0E+00	1E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-233	1.5	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	1E-06	5E-08	2E-07	4E-09	1E-08	2E-07	0E+00	0E+00	0E+00	2E-06
U-234	0.3	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	3E-08	5E-09	5E-08	9E-10	3E-09	2E-08	0E+00	0E+00	0E+00	1E-07
U-235	0.01	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4E-08	2E-10	2E-09	5E-11	9E-11	8E-10	0E+00	0E+00	0E+00	4E-08
U-238	0.24	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	3E-09	4E-08	6E-10	3E-09	2E-08	0E+00	0E+00	0E+00	2E-07
											Excess Cancer Risk	**1E-06**	**5E-08**	**3E-07**	**5E-09**	**2E-08**	**2E-07**	**0E+00**	**0E+00**	**0E+00**	**2E-06**

Table D-6-9: Results of Radiological Risk Assessment For EA H Plus I at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
C-14	3.5	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	6E-12	3E-10	6E-07	8E-08	6E-08	2E-10	0E+00	0E+00	0E+00	7E-07	0%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	0	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
H-3	75.8	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	3E-07	2E-06	1E-07	2E-07	3E-10	3E-07	1E-08	4E-08	3E-06	1%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Se-79	2.7	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	1E-10	2E-11	6E-07	9E-07	2E-07	9E-09	5E-06	3E-05	8E-06	4E-05	12%
Sn-126	7.7	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	2E-04	9E-10	2E-07	9E-08	2E-08	1E-07	5E-05	3E-05	9E-06	3E-04	87%
Sr-90	0	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	1.6	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	3E-08	3E-08	2E-07	4E-09	2E-08	1E-07	0E+00	0E+00	0E+00	5E-07	0%
U-234	0.35	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	8E-10	7E-09	5E-08	9E-10	4E-09	3E-08	0E+00	0E+00	0E+00	9E-08	0%
U-235	0.0078	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	4E-08	1E-10	1E-09	2E-11	9E-11	6E-10	0E+00	0E+00	0E+00	4E-08	0%
U-238	0.18	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2E-07	3E-09	3E-08	6E-10	3E-09	2E-08	0E+00	0E+00	0E+00	2E-07	0%
											Excess Cancer Risk	**2.E-04**	**4.E-07**	**3.E-06**	**1.E-06**	**5.E-07**	**3.E-07**	**6.E-05**	**6.E-05**	**2.E-05**	**4.E-04**	

Table D-6-10: Results of Radiological Risk Assessment For EA H Plus I at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
C-14	3.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cs-137	0	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
H-3	75.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Se-79	2.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sn-126	7.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sr-90	0	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-233	1.6	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	1E-06	5E-08	2E-07	4E-09	1E-08	2E-07	0E+00	0E+00	0E+00	2E-06
U-234	0.35	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	4E-08	6E-09	6E-08	1E-09	4E-09	2E-08	0E+00	0E+00	0E+00	1E-07
U-235	0.0078	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	3E-08	1E-10	1E-09	4E-11	7E-11	6E-10	0E+00	0E+00	0E+00	3E-08
U-238	0.18	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	1E-07	2E-09	3E-08	5E-10	2E-09	1E-08	0E+00	0E+00	0E+00	2E-07
											Excess Cancer Risk	**2E-06**	**6E-08**	**3E-07**	**5E-09**	**2E-08**	**2E-07**	**0E+00**	**0E+00**	**0E+00**	**2E-06**

Table D-6-11: Results of Radiological Risk Assessment For EA J at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
C-14	13.7	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	3.E-11	1.E-09	2.E-06	3.E-07	2.E-07	6.E-10	0.E+00	0.E+00	0.E+00	3.E-06	1%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Cs-137	5.7	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	9.E-05	3.E-10	4.E-06	2.E-06	1.E-06	1.E-07	0.E+00	0.E+00	0.E+00	1.E-04	29%
H-3	0	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-238	0.067	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	4.E-11	2.E-09	6.E-09	7.E-11	2.E-12	9.E-09	0.E+00	0.E+00	0.E+00	2.E-08	0%
Pu-239	0.038	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	7.E-11	2.E-09	4.E-09	4.E-11	1.E-12	6.E-09	0.E+00	0.E+00	0.E+00	1.E-08	0%
Pu-241	0.14	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	5.E-10	1.E-10	3.E-10	2.E-12	1.E-13	4.E-10	0.E+00	0.E+00	0.E+00	1.E-09	0%
Se-79	11.3	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	4.E-10	6.E-11	3.E-06	4.E-06	8.E-07	4.E-08	2.E-05	1.E-04	3.E-05	2.E-04	53%
Sn-126	0	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Sr-90	4	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	5.E-07	9.E-10	5.E-05	6.E-06	3.E-06	2.E-07	0.E+00	0.E+00	0.E+00	6.E-05	18%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
U-233	0	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
U-234	0	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
U-235	0.01	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	5.E-08	2.E-10	1.E-09	3.E-11	1.E-10	8.E-10	0.E+00	0.E+00	0.E+00	5.E-08	0%
U-238	0.22	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2.E-07	4.E-09	4.E-08	7.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	3.E-07	0%
											Excess Cancer Risk	**9.E-05**	**1.E-08**	**6.E-05**	**1.E-05**	**5.E-06**	**4.E-07**	**2.E-05**	**1.E-04**	**3.E-05**	**3.E-04**	

Table D-6-12: Results of Radiological Risk Assessment For EA J at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	7E-15	3.E-20	3.E-16	1.E-16	8.E-17	1.E-17	0.E+00	0.E+00	0.E+00	7.E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	2E-12	1.E-12	6.E-12	9.E-14	2.E-13	5.E-12	0.E+00	0.E+00	0.E+00	1.E-11
Pu-239	0.038	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	6E-11	1.E-09	4.E-09	4.E-11	1.E-12	5.E-09	0.E+00	0.E+00	0.E+00	1.E-08
Pu-241	0.14	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	2E-10	2.E-11	7.E-11	4.E-13	4.E-14	1.E-10	0.E+00	0.E+00	0.E+00	4.E-10
Se-79	11.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	1E-17	3.E-20	2.E-15	2.E-16	9.E-17	7.E-18	0.E+00	0.E+00	0.E+00	2.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4E-08	2.E-10	2.E-09	5.E-11	9.E-11	8.E-10	0.E+00	0.E+00	0.E+00	4.E-08
U-238	0.22	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	3.E-09	3.E-08	6.E-10	2.E-09	2.E-08	0.E+00	0.E+00	0.E+00	2.E-07
											Excess Cancer Risk	**2.E-07**	**5.E-09**	**4.E-08**	**7.E-10**	**3.E-09**	**2.E-08**	**0.E+00**	**0.E+00**	**0.E+00**	**3.E-07**

Table D-6-13: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
C-14	53.8	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	1E-10	4.E-09	9.E-06	1.E-06	9.E-07	2.E-09	0.E+00	0.E+00	0.E+00	1.E-05	2%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Cs-137	3.5	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	6E-05	2.E-10	2.E-06	1.E-06	6.E-07	8.E-08	0.E+00	0.E+00	0.E+00	6.E-05	12%
H-3	4.7	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	2.E-08	1.E-07	9.E-09	1.E-08	2.E-11	2.E-08	9.E-10	3.E-09	2.E-07	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Ni-63	390	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	1.E-09	1.E-05	8.E-07	7.E-06	3.E-07	0.E+00	0.E+00	0.E+00	2.E-05	3%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Se-79	1.6	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	6E-11	9.E-12	4.E-07	5.E-07	1.E-07	5.E-09	3.E-06	2.E-05	5.E-06	3.E-05	5%
Sn-126	8.9	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	3E-04	1.E-09	2.E-07	1.E-07	3.E-08	1.E-07	6.E-05	4.E-05	1.E-05	4.E-04	72%
Sr-90	2	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	2E-07	5.E-10	3.E-05	3.E-06	1.E-06	1.E-07	0.E+00	0.E+00	0.E+00	3.E-05	6%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
U-233	1.5	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	3E-08	3.E-08	2.E-07	4.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07	0%
U-234	0.25	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	6E-10	5.E-09	4.E-08	6.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	6.E-08	0%
U-235	0.01	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	5E-08	2.E-10	1.E-09	3.E-11	1.E-10	8.E-10	0.E+00	0.E+00	0.E+00	5.E-08	0%
U-238	0.23	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2E-07	4.E-09	4.E-08	7.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	3.E-07	0%
											Excess Cancer Risk	**3.E-04**	**7.E-08**	**5.E-05**	**7.E-06**	**1.E-05**	**8.E-07**	**7.E-05**	**6.E-05**	**2.E-05**	**5.E-04**	

Table D-6-14: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 1000 Year

Nuclide	EPC pCi/g	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	4E-15	2.E-20	2.E-16	8.E-17	5.E-17	6.E-18	0.E+00	0.E+00	0.E+00	4.E-15
H-3	4.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	8.E-13	5.E-09	4.E-10	3.E-09	1.E-10	0.E+00	0.E+00	0.E+00	9.E-09
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	7E-18	1.E-20	8.E-16	8.E-17	4.E-17	4.E-18	0.E+00	0.E+00	0.E+00	9.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	1E-06	5.E-08	2.E-07	4.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.25	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	3E-08	4.E-09	4.E-08	7.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	9.E-08
U-235	0.01	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4E-08	2.E-10	2.E-09	5.E-11	9.E-11	8.E-10	0.E+00	0.E+00	0.E+00	4.E-08
U-238	0.23	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	3.E-09	3.E-08	6.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	2.E-07
											Excess Cancer Risk	**1.E-06**	**5.E-08**	**3.E-07**	**5.E-09**	**2.E-08**	**2.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-06**

Table D-6-15: Results of Radiological Risk Assessment For EA P at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	2.2	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	5.E-07	6.E-08	2.E-07	1.E-09	1.E-10	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06	0%
C-14	0	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Co-60	0.83	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	2.E-05	2.E-11	3.E-07	7.E-08	2.E-08	4.E-09	0.E+00	0.E+00	0.E+00	2.E-05	1%
Cs-137	32.1	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	5.E-04	2.E-09	2.E-05	1.E-05	6.E-06	8.E-07	0.E+00	0.E+00	0.E+00	6.E-04	27%
H-3	308	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0.E+00	1.E-06	7.E-06	6.E-07	9.E-07	1.E-09	1.E-06	6.E-08	2.E-07	1.E-05	1%
I-129	0.81	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	4.E-08	8.E-11	3.E-06	4.E-07	1.E-06	2.E-07	0.E+00	0.E+00	0.E+00	4.E-06	0%
Ni-63	85	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0.E+00	3.E-10	2.E-06	2.E-07	1.E-06	6.E-08	0.E+00	0.E+00	0.E+00	4.E-06	0%
Np-237	1.5	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	1.E-05	3.E-08	2.E-06	3.E-08	3.E-10	1.E-07	0.E+00	0.E+00	0.E+00	1.E-05	1%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-239	10.7	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	2.E-08	4.E-07	1.E-06	1.E-08	3.E-10	2.E-06	0.E+00	0.E+00	0.E+00	3.E-06	0%
Pu-241	39.9	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	1.E-07	3.E-08	8.E-08	6.E-10	3.E-11	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07	0%
Se-79	4.6	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	2.E-10	3.E-11	1.E-06	1.E-06	3.E-07	1.E-08	8.E-06	5.E-05	1.E-05	7.E-05	4%
Sn-126	0	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Sr-90	82.2	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	1.E-05	2.E-08	1.E-03	1.E-04	6.E-05	5.E-06	0.E+00	0.E+00	0.E+00	1.E-03	59%
Tc-99	24	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	7.E-09	3.E-10	1.E-04	2.E-07	3.E-06	3.E-08	4.E-05	1.E-07	3.E-06	2.E-04	8%
U-233	1.9	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	4.E-08	4.E-08	3.E-07	5.E-09	2.E-08	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07	0%
U-234	0.72	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	2.E-09	1.E-08	1.E-07	2.E-09	8.E-09	6.E-08	0.E+00	0.E+00	0.E+00	2.E-07	0%
U-235	0.025	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	1.E-07	5.E-10	4.E-09	7.E-11	3.E-10	2.E-09	0.E+00	0.E+00	0.E+00	1.E-07	0%
U-238	0.52	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	5.E-07	9.E-09	9.E-08	2.E-09	7.E-09	5.E-08	0.E+00	0.E+00	0.E+00	7.E-07	0%
											Excess Cancer Risk	**6.E-04**	**2.E-06**	**1.E-03**	**1.E-04**	**7.E-05**	**8.E-06**	**5.E-05**	**5.E-05**	**2.E-05**	**2.E-03**	

Table D-6-16: Results of Radiological Risk Assessment For EA P at T = 1000 Year

Nuclide	EPC pCi/g	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	1.E-07	1.E-08	3.E-08	2.E-10	2.E-11	5.E-08	0.E+00	0.E+00	0.E+00	2.E-07
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	4.E-14	1.E-19	2.E-15	8.E-16	4.E-16	6.E-17	0.E+00	0.E+00	0.E+00	4.E-14
H-3	308	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	2E-08	9E-09	3E-08	6E-08	2.E-12	5.E-15	2.E-10	2.E-11	7.E-11	1.E-11	2.E-08	7.E-09	3.E-08	5.E-08
Ni-63	85	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0.E+00	2.E-13	1.E-09	9.E-11	7.E-10	3.E-11	0.E+00	0.E+00	0.E+00	2.E-09
Np-237	1.5	7E-06	2E-08	1E-06	2E-08	3E-10	7E-08	0E+00	0E+00	0E+00	8E-06	1.E-05	3.E-08	2.E-06	3.E-08	4.E-10	1.E-07	0.E+00	0.E+00	0.E+00	1.E-05
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	2.E-08	4.E-07	1.E-06	1.E-08	3.E-10	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
Pu-241	39.9	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	6.E-08	7.E-09	2.E-08	1.E-10	1.E-11	3.E-08	0.E+00	0.E+00	0.E+00	1.E-07
Se-79	4.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	3.E-16	6.E-19	3.E-14	3.E-15	2.E-15	1.E-16	0.E+00	0.E+00	0.E+00	4.E-14
Tc-99	24	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	2.E-06	6.E-08	3.E-07	5.E-09	2.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.72	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	8.E-08	1.E-08	1.E-07	2.E-09	7.E-09	5.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.025	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	1.E-07	5.E-10	4.E-09	1.E-10	2.E-10	2.E-09	0.E+00	0.E+00	0.E+00	1.E-07
U-238	0.52	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	4.E-07	7.E-09	8.E-08	1.E-09	6.E-09	4.E-08	0.E+00	0.E+00	0.E+00	5.E-07
											Excess Cancer Risk	**1.E-05**	**5.E-07**	**3.E-06**	**5.E-08**	**3.E-08**	**2.E-06**	**2.E-08**	**7.E-09**	**3.E-08**	**2.E-05**

Table D-6-17: Results of Radiological Risk Assessment For EA R at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g))										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
C-14	0	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Cs-137	0	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
H-3	2.5	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0.E+00	1.E-08	5.E-08	5.E-09	7.E-09	1.E-11	1.E-08	5.E-10	1.E-09	9.E-08	1%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Np-237	0	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Se-79	0	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Sn-126	0	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
Sr-90	0.37	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	5.E-08	9.E-11	5.E-06	5.E-07	3.E-07	2.E-08	0.E+00	0.E+00	0.E+00	6.E-06	83%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0%
U-233	2.4	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	5.E-08	5.E-08	4.E-07	6.E-09	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	7.E-07	10%
U-234	0.22	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	5.E-10	4.E-09	3.E-08	6.E-10	2.E-09	2.E-08	0.E+00	0.E+00	0.E+00	6.E-08	1%
U-235	0.01	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	5.E-08	2.E-10	1.E-09	3.E-11	1.E-10	8.E-10	0.E+00	0.E+00	0.E+00	5.E-08	1%
U-238	0.22	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2.E-07	4.E-09	4.E-08	7.E-10	3.E-09	2.E-08	0.E+00	0.E+00	0.E+00	3.E-07	4%
											Excess Cancer Risk	**4.E-07**	**7.E-08**	**5.E-06**	**5.E-07**	**3.E-07**	**3.E-07**	**1.E-08**	**5.E-10**	**1.E-09**	**7.E-06**	

RPP-RPT-58329, Rev. 3

Table D-6-18: Results of Radiological Risk Assessment For EA R at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	9E-09	4E-09	1E-08	3E-08	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-06	1E-08	5E-07	1E-08	1E-10	4E-08	0E+00	0E+00	0E+00	4E-06	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	1E-18	3.E-21	1.E-16	2.E-17	8.E-18	7.E-19	0.E+00	0.E+00	0.E+00	2.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	#####	#####	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	2E-06	7.E-08	4.E-07	6.E-09	2.E-08	3.E-07	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.22	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	2E-08	4.E-09	4.E-08	6.E-10	2.E-09	2.E-08	0.E+00	0.E+00	0.E+00	8.E-08
U-235	0.01	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4E-08	2.E-10	2.E-09	5.E-11	9.E-11	8.E-10	0.E+00	0.E+00	0.E+00	4.E-08
U-238	0.22	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	3.E-09	3.E-08	6.E-10	2.E-09	2.E-08	0.E+00	0.E+00	0.E+00	2.E-07
											Excess Cancer Risk	**2.E-06**	**8.E-08**	**4.E-07**	**7.E-09**	**3.E-08**	**3.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**3.E-06**

Table D-6-19: Results of Radiological Risk Assessment For EA U at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year										
		RSR (1/(pCi/g)										Risk (unitless)										
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways	% Cont
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		
Am-241	0	2E-07	3E-08	8E-08	4E-10	4E-11	1E-07	0E+00	0E+00	0E+00	5E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
C-14	1.7	2E-12	8E-11	2E-07	2E-08	2E-08	4E-11	0E+00	0E+00	0E+00	2E-07	3E-12	1E-10	3E-07	4E-08	3E-08	8E-11	0E+00	0E+00	0E+00	3E-07	0%
Co-60	0	3E-05	2E-11	3E-07	9E-08	2E-08	5E-09	0E+00	0E+00	0E+00	3E-05	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Cs-137	2.1	2E-05	6E-11	7E-07	3E-07	2E-07	2E-08	0E+00	0E+00	0E+00	2E-05	3E-05	1E-10	1E-06	7E-07	4E-07	5E-08	0E+00	0E+00	0E+00	4E-05	9%
H-3	0	0E+00	4E-09	2E-08	2E-09	3E-09	4E-12	4E-09	2E-10	6E-10	4E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
I-129	0	5E-08	1E-10	3E-06	4E-07	1E-06	2E-07	0E+00	0E+00	0E+00	6E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Ni-63	0	0E+00	4E-12	3E-08	2E-09	2E-08	7E-10	0E+00	0E+00	0E+00	5E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Np-237	0.6	7E-06	2E-08	1E-06	2E-08	2E-10	8E-08	0E+00	0E+00	0E+00	8E-06	4E-06	1E-08	7E-07	1E-08	1E-10	5E-08	0E+00	0E+00	0E+00	5E-06	1%
Pu-238	0	6E-10	3E-08	9E-08	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Pu-241	0	3E-09	7E-10	2E-09	1E-11	9E-13	3E-09	0E+00	0E+00	0E+00	9E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
Se-79	2.8	4E-11	6E-12	2E-07	3E-07	7E-08	3E-09	2E-06	1E-05	3E-06	2E-05	1E-10	2E-11	6E-07	9E-07	2E-07	9E-09	5E-06	3E-05	8E-06	5E-05	11%
Sn-126	6.3	3E-05	1E-10	2E-08	1E-08	3E-09	1E-08	7E-06	4E-06	1E-06	4E-05	2E-04	7E-10	1E-07	8E-08	2E-08	8E-08	4E-05	3E-05	7E-06	3E-04	63%
Sr-90	4.2	1E-07	2E-10	1E-05	1E-06	7E-07	6E-08	0E+00	0E+00	0E+00	2E-05	5E-07	1E-09	5E-05	6E-06	3E-06	2E-07	0E+00	0E+00	0E+00	6E-05	15%
Tc-99	0	3E-10	1E-11	5E-06	6E-09	1E-07	1E-09	2E-06	5E-09	1E-07	7E-06	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0%
U-233	2.1	2E-08	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	4E-08	4E-08	3E-07	5E-09	2E-08	2E-07	0E+00	0E+00	0E+00	6E-07	0%
U-234	0.31	2E-09	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	3E-07	7E-10	6E-09	4E-08	8E-10	3E-09	2E-08	0E+00	0E+00	0E+00	8E-08	0%
U-235	0.009	5E-06	2E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	5E-06	4E-08	2E-10	1E-09	2E-11	1E-10	7E-10	0E+00	0E+00	0E+00	4E-08	0%
U-238	0.21	1E-06	2E-08	2E-07	3E-09	1E-08	1E-07	0E+00	0E+00	0E+00	1E-06	2E-07	4E-09	4E-08	7E-10	3E-09	2E-08	0E+00	0E+00	0E+00	3E-07	0%
				Excess Cancer Risk								**2.2.E-04**	**7.E-08**	**6.E-05**	**8.E-06**	**4.E-06**	**7.E-07**	**5.E-05**	**6.E-05**	**2.E-05**	**4.E-04**	

Table D-6-20: Results of Radiological Risk Assessment For EA U at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	5E-08	5E-09	2E-08	9E-11	8E-12	2E-08	0E+00	0E+00	0E+00	9E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
C-14	1.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Cs-137	2.1	1E-15	5E-21	5E-17	2E-17	1E-17	2E-18	0E+00	0E+00	0E+00	1E-15	3E-15	1E-20	1E-16	5E-17	3E-17	4E-18	0E+00	0E+00	0E+00	3E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
I-129	0	3E-12	6E-15	2E-10	3E-11	9E-11	1E-11	2E-08	9E-09	3E-08	6E-08	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Ni-63	0	0E+00	2E-15	1E-11	1E-12	9E-12	4E-13	0E+00	0E+00	0E+00	2E-11	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Np-237	0.6	7E-06	2E-08	1E-06	2E-08	3E-10	7E-08	0E+00	0E+00	0E+00	8E-06	4E-06	1E-08	6E-07	1E-08	2E-10	4E-08	0E+00	0E+00	0E+00	5E-06
Pu-238	0	3E-11	2E-11	9E-11	1E-12	4E-12	7E-11	0E+00	0E+00	0E+00	2E-10	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-239	0	2E-09	4E-08	1E-07	1E-09	3E-11	1E-07	0E+00	0E+00	0E+00	3E-07	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Pu-241	0	2E-09	2E-10	5E-10	3E-12	3E-13	7E-10	0E+00	0E+00	0E+00	3E-09	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Se-79	2.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sn-126	6.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
Sr-90	4.2	4E-18	7E-21	4E-16	4E-17	2E-17	2E-18	0E+00	0E+00	0E+00	4E-16	2E-17	3E-20	2E-15	2E-16	9E-17	7E-18	0E+00	0E+00	0E+00	2E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
U-233	2.1	8E-07	3E-08	2E-07	2E-09	9E-09	1E-07	0E+00	0E+00	0E+00	1E-06	2E-06	6E-08	3E-07	5E-09	2E-08	2E-07	0E+00	0E+00	0E+00	2E-06
U-234	0.31	1E-07	2E-08	2E-07	3E-09	1E-08	7E-08	0E+00	0E+00	0E+00	4E-07	3E-08	5E-09	5E-08	9E-10	3E-09	2E-08	0E+00	0E+00	0E+00	1E-07
U-235	0.009	4E-06	2E-08	2E-07	5E-09	9E-09	8E-08	0E+00	0E+00	0E+00	4E-06	4E-08	2E-10	1E-09	4E-11	8E-11	7E-10	0E+00	0E+00	0E+00	4E-08
U-238	0.21	8E-07	1E-08	1E-07	3E-09	1E-08	8E-08	0E+00	0E+00	0E+00	1E-06	2E-07	3E-09	3E-08	5E-10	2E-09	2E-08	0E+00	0E+00	0E+00	2E-07
											Excess Cancer Risk	**6E-06**	**8E-08**	**1E-06**	**2E-08**	**2E-08**	**3E-07**	**0E+00**	**0E+00**	**0E+00**	**7E-06**

Table D-6-21: Maximum Risk Assessment Results for Resident Receptor

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Radiological COPCs										
External Gamma	1.E-03	2.E-03	6.E-04	1.E-04	2.E-04	9.E-05	3.E-04	6.E-04	4.E-07	2.E-04
Inhalation	4.E-08	1.E-08	6.E-08	4.E-08	4.E-07	1.E-08	7.E-08	2.E-06	7.E-08	7.E-08
Fruits and Vegetables Ingestion	5.E-04	4.E-04	2.E-04	3.E-05	6.E-05	8.E-05	1.E-04	1.E-03	5.E-06	1.E-04
Meat Ingestion	2.E-04	2.E-04	1.E-04	4.E-05	6.E-05	1.E-04	6.E-05	2.E-04	5.E-07	7.E-05
Milk	6.E-05	7.E-05	4.E-05	1.E-05	2.E-05	4.E-05	3.E-05	9.E-05	3.E-07	2.E-05
Soil Ingestion	2.E-06	1.E-06	7.E-07	3.E-07	3.E-07	4.E-07	8.E-07	8.E-06	3.E-07	7.E-07
Cumulative ELCR	**2E-03**	**2E-03**	**1E-03**	**2E-04**	**4.E-04**	**3.E-04**	**5.E-04**	**2E-03**	7.E-06	**4.E-04**
Major Risk Contributors	Cs-137; Se-79; Sn-126; Sr-90.	Cs-137; Sn-126; Sr-90.	Cs-137; Se-79; Sn-126; Sr-90.	Cs-137; Se-79; Sn-126.	Se-79; Sn-126.	Cs-137; Se-79; Sr-90.	Cs-137; Ni-63; Se-79; Sn-126; Sr-90.	Co-60; Cs-137; Se-79; Sr-90; Tc-99.	None	Cs-137; Se-79; Sn-126; Sr-90.

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR RESIDENTIAL RECEPTOR

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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   1
 Intrisk : Residual Dose and Risk Assessment for Residential Receptor
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD
```

Table of Contents

Part III: Intake Quantities and Health Risk Factors


```
 Cancer Risk Slope Factors ...............................    2
 Risk Slope and ETFG for the Ground Pathway ..............    6
 Amount of Intake Quantities and Excess Cancer Risks
      Time= 0.000E+00 ....................................    8
      Time= 1.000E+00 ....................................   13
      Time= 3.000E+00 ....................................   18
      Time= 1.000E+01 ....................................   23
      Time= 3.000E+01 ....................................   28
      Time= 1.000E+02 ....................................   33
      Time= 3.000E+02 ....................................   38
      Time= 1.000E+03 ....................................   43
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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   2
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 3
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   4
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   5
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                    Current     Base      Parameter
  Menu                          Parameter                            Value      Case*       Name
-----------------------------------------------------------------------------------------------------
Sf-Rn  Bi-214                                                      1.50E-11   1.50E-11   SLPFRN(1,4)

Sf-Rn  Radon K factors, (mrem/WLM):
Sf-Rn  Rn-222 Indoor                                               7.60E+02   7.60E+02   KFACTR(1,1)
Sf-Rn  Rn-222 Outdoor                                              5.70E+02   5.70E+02   KFACTR(1,2)
------Ï-------------------------------------------------------------Ï-----------Ï-----------Ï--------------
*Base Case means Default.Lib w/o Associate Nuclide contributions.
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RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 6
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	3.334E-01	3.334E-01	3.334E-01	3.334E-01	3.334E-01	3.334E-01	3.334E-01	3.334E-01
Ac-227	3.480E-10	3.341E-01	3.341E-01	3.341E-01	3.341E-01	3.341E-01	3.341E-01	3.341E-01	3.341E-01
Am-241	2.760E-08	3.355E-01	3.355E-01	3.355E-01	3.355E-01	3.355E-01	3.355E-01	3.355E-01	3.355E-01
At-217	1.320E-09	3.253E-01	3.253E-01	3.253E-01	3.253E-01	3.253E-01	3.253E-01	3.253E-01	3.253E-01
At-218	3.570E-09	3.354E-01	3.354E-01	3.354E-01	3.354E-01	3.354E-01	3.354E-01	3.354E-01	3.354E-01
Ba-137m	2.690E-06	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01
Bi-210	2.760E-09	3.281E-01	3.281E-01	3.281E-01	3.281E-01	3.281E-01	3.281E-01	3.281E-01	3.281E-01
Bi-211	1.880E-07	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01
Bi-213	5.650E-07	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01
Bi-214	7.480E-06	3.263E-01	3.263E-01	3.263E-01	3.263E-01	3.263E-01	3.263E-01	3.263E-01	3.263E-01
C-14	7.830E-12	3.379E-01	3.379E-01	3.379E-01	3.379E-01	3.379E-01	3.379E-01	3.379E-01	3.379E-01
Co-60	1.240E-05	3.261E-01	3.261E-01	3.261E-01	3.261E-01	3.261E-01	3.261E-01	3.261E-01	3.261E-01
Cs-137	5.320E-10	3.313E-01	3.313E-01	3.313E-01	3.313E-01	3.313E-01	3.313E-01	3.313E-01	3.313E-01
Fr-221	1.110E-07	3.312E-01	3.312E-01	3.312E-01	3.312E-01	3.312E-01	3.312E-01	3.312E-01	3.312E-01
Fr-223	1.400E-07	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01
H-3	0.000E+00	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01
I-129	6.100E-09	3.440E-01	3.440E-01	3.440E-01	3.440E-01	3.440E-01	3.440E-01	3.440E-01	3.440E-01
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01
Pa-231	1.390E-07	3.284E-01	3.284E-01	3.284E-01	3.284E-01	3.284E-01	3.284E-01	3.284E-01	3.284E-01
Pa-233	7.430E-07	3.288E-01	3.288E-01	3.288E-01	3.288E-01	3.288E-01	3.288E-01	3.288E-01	3.288E-01
Pa-234	8.710E-06	3.260E-01	3.260E-01	3.260E-01	3.260E-01	3.260E-01	3.260E-01	3.260E-01	3.260E-01
Pa-234m	6.870E-08	3.256E-01	3.256E-01	3.256E-01	3.256E-01	3.256E-01	3.256E-01	3.256E-01	3.256E-01
Pb-209	5.370E-10	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01
Pb-210	1.410E-09	3.383E-01	3.383E-01	3.383E-01	3.383E-01	3.383E-01	3.383E-01	3.383E-01	3.383E-01
Pb-211	2.290E-07	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01
Pb-214	9.820E-07	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01	3.282E-01
Po-210	3.950E-11	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01
Po-211	3.580E-08	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01
Po-215	7.480E-10	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01
Po-218	4.260E-11	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01
Pu-238	7.220E-11	3.507E-01	3.507E-01	3.507E-01	3.507E-01	3.507E-01	3.507E-01	3.507E-01	3.507E-01
Pu-239	2.000E-10	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01
Pu-241	4.110E-12	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01	3.344E-01
Ra-223	4.340E-07	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01	3.301E-01
Ra-225	5.910E-09	3.378E-01	3.378E-01	3.378E-01	3.378E-01	3.378E-01	3.378E-01	3.378E-01	3.378E-01
Ra-226	2.290E-08	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01	3.325E-01
Rn-219	2.250E-07	3.285E-01	3.285E-01	3.285E-01	3.285E-01	3.285E-01	3.285E-01	3.285E-01	3.285E-01
Rn-222	1.740E-09	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01
Sb-126	1.280E-05	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01
Sb-126m	6.940E-06	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01	3.238E-01

Se-79	1.100E-11	3.352E-01	3.352E-01	3.352E-01	3.352E-01	3.352E-01	3.352E-01	3.352E-01	3.352E-01
Sn-126	9.960E-08	3.348E-01	3.348E-01	3.348E-01	3.348E-01	3.348E-01	3.348E-01	3.348E-01	3.348E-01
Sr-90	4.820E-10	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01
Tc-99	8.140E-11	3.342E-01	3.342E-01	3.342E-01	3.342E-01	3.342E-01	3.342E-01	3.342E-01	3.342E-01
Th-227	3.780E-07	3.314E-01	3.314E-01	3.314E-01	3.314E-01	3.314E-01	3.314E-01	3.314E-01	3.314E-01
Th-229	2.250E-07	3.336E-01	3.336E-01	3.336E-01	3.336E-01	3.336E-01	3.336E-01	3.336E-01	3.336E-01
Th-230	8.190E-10	3.338E-01	3.338E-01	3.338E-01	3.338E-01	3.338E-01	3.338E-01	3.338E-01	3.338E-01

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   7
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	3.347E-01	3.347E-01	3.347E-01	3.347E-01	3.347E-01	3.347E-01	3.347E-01	3.347E-01
Th-234	1.630E-08	3.346E-01	3.346E-01	3.346E-01	3.346E-01	3.346E-01	3.346E-01	3.346E-01	3.346E-01
Tl-207	1.520E-08	3.254E-01	3.254E-01	3.254E-01	3.254E-01	3.254E-01	3.254E-01	3.254E-01	3.254E-01
Tl-209	9.830E-06	3.274E-01	3.274E-01	3.274E-01	3.274E-01	3.274E-01	3.274E-01	3.274E-01	3.274E-01
Tl-210	0.000E+00	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01	3.600E-01
U-233	9.820E-10	3.329E-01	3.329E-01	3.329E-01	3.329E-01	3.329E-01	3.329E-01	3.329E-01	3.329E-01
U-234	2.520E-10	3.371E-01	3.371E-01	3.371E-01	3.371E-01	3.371E-01	3.371E-01	3.371E-01	3.371E-01
U-235	5.180E-07	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01	3.324E-01
U-237	3.760E-07	3.326E-01	3.326E-01	3.326E-01	3.326E-01	3.326E-01	3.326E-01	3.326E-01	3.326E-01
U-238	4.990E-11	3.495E-01	3.495E-01	3.495E-01	3.495E-01	3.495E-01	3.495E-01	3.495E-01	3.495E-01
Y-90	1.910E-08	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01	3.255E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 8
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	2.793E-02	2.319E+01	1.278E-01	1.301E-02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.566E+01
C-14	6.532E+01	1.124E+05	1.373E+04	1.044E+04	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.366E+05
Co-60	2.793E-02	1.854E+03	5.346E+02	1.149E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.536E+03
Cs-137	2.793E-02	9.270E+02	4.347E+02	2.532E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.647E+03
H-3	5.485E+03	1.530E+05	1.161E+04	1.837E+04	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.830E+05
I-129	2.793E-02	4.637E+02	5.866E+01	1.877E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.424E+02
Ni-63	2.793E-02	1.159E+03	8.775E+01	7.618E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.041E+03
Np-237	2.793E-02	4.635E+02	8.371E+00	9.377E-02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.043E+02
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	2.793E-02	2.319E+01	2.557E-01	6.507E-03	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.578E+01
Pu-239	2.793E-02	2.319E+01	2.557E-01	6.507E-03	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.578E+01
Pu-241	2.793E-02	2.319E+01	2.557E-01	6.507E-03	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.578E+01
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	2.793E-02	2.318E+03	3.285E+03	7.032E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.338E+03
Sn-126	2.793E-02	5.795E+01	3.016E+01	7.473E+00	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.279E+02
Sr-90	2.793E-02	6.953E+03	7.524E+02	3.985E+02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.136E+03
Tc-99	2.793E-02	1.159E+05	1.532E+02	3.229E+03	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.193E+05
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	2.793E-02	5.795E+01	1.025E+00	4.484E+00	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.579E+01
U-234	2.793E-02	5.795E+01	1.025E+00	4.484E+00	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.579E+01
U-235	2.793E-02	5.795E+01	1.025E+00	4.484E+00	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.579E+01
U-238	2.793E-02	5.795E+01	1.025E+00	4.484E+00	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.579E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/29/2014  17:59  Page   9
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	7.795E-10	0.0000	9.597E-12	0.0000	6.201E-11	0.0000	2.773E-13	0.0000	1.592E-13	0.0000	3.407E-11	0.0000
Am-241	2.391E-07	0.0016	2.718E-08	0.0002	8.022E-08	0.0005	4.423E-10	0.0000	4.501E-11	0.0000	1.118E-07	0.0008
C-14	1.833E-12	0.0000	8.040E-11	0.0000	1.626E-07	0.0011	2.338E-08	0.0002	1.672E-08	0.0001	4.480E-11	0.0000
Co-60	2.970E-05	0.2004	2.072E-11	0.0000	3.037E-07	0.0020	8.757E-08	0.0006	1.881E-08	0.0001	5.295E-09	0.0000
Cs-137	1.605E-05	0.1083	6.099E-11	0.0000	6.759E-07	0.0046	3.170E-07	0.0021	1.846E-07	0.0012	2.357E-08	0.0002
H-3	0.000E+00	0.0000	4.426E-09	0.0000	2.154E-08	0.0001	1.844E-09	0.0000	2.790E-09	0.0000	4.414E-12	0.0000
I-129	4.824E-08	0.0003	1.027E-10	0.0000	3.433E-06	0.0232	4.347E-07	0.0029	1.390E-06	0.0094	2.393E-07	0.0016
Ni-63	0.000E+00	0.0000	3.803E-12	0.0000	2.601E-08	0.0002	1.969E-09	0.0000	1.710E-08	0.0001	7.255E-10	0.0000
Np-237	6.755E-06	0.0456	2.066E-08	0.0001	1.087E-06	0.0073	1.963E-08	0.0001	2.199E-10	0.0000	7.581E-08	0.0005
Pa-231	3.251E-10	0.0000	1.516E-11	0.0000	3.723E-10	0.0000	4.240E-11	0.0000	1.002E-13	0.0000	5.204E-11	0.0000
Pb-210	2.750E-15	0.0000	1.693E-15	0.0000	1.603E-12	0.0000	3.056E-14	0.0000	2.600E-14	0.0000	2.193E-13	0.0000
Pu-238	5.947E-10	0.0000	3.425E-08	0.0002	9.206E-08	0.0006	1.015E-09	0.0000	2.583E-11	0.0000	1.283E-07	0.0009
Pu-239	1.727E-09	0.0000	3.997E-08	0.0003	1.048E-07	0.0007	1.156E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0010
Pu-241	6.578E-11	0.0000	3.586E-10	0.0000	7.839E-10	0.0000	8.642E-12	0.0000	2.199E-13	0.0000	1.093E-09	0.0000
Ra-226	3.149E-11	0.0000	8.973E-15	0.0000	5.400E-12	0.0000	8.325E-14	0.0000	1.830E-13	0.0000	1.891E-13	0.0000
Se-79	3.711E-11	0.0000	5.595E-12	0.0000	2.268E-07	0.0015	3.253E-07	0.0022	6.930E-08	0.0005	3.153E-09	0.0000
Sn-126	2.879E-05	0.1943	1.161E-10	0.0000	2.295E-08	0.0002	1.200E-08	0.0001	2.958E-09	0.0000	1.276E-08	0.0001
Sr-90	1.230E-07	0.0008	2.335E-10	0.0000	1.278E-05	0.0862	1.383E-06	0.0093	7.325E-07	0.0049	5.943E-08	0.0004
Tc-99	2.739E-10	0.0000	1.071E-11	0.0000	4.681E-06	0.0316	6.267E-09	0.0000	1.315E-07	0.0009	1.302E-09	0.0000
Th-229	1.219E-08	0.0001	2.043E-10	0.0000	5.308E-10	0.0000	5.912E-12	0.0000	7.638E-13	0.0000	7.369E-10	0.0000
Th-230	8.302E-13	0.0000	2.884E-12	0.0000	8.416E-12	0.0000	9.372E-14	0.0000	1.211E-14	0.0000	1.168E-11	0.0000
U-233	8.476E-09	0.0001	2.049E-08	0.0001	1.456E-07	0.0010	2.576E-09	0.0000	1.127E-08	0.0001	8.122E-08	0.0005
U-234	2.203E-09	0.0000	2.013E-08	0.0001	1.435E-07	0.0010	2.539E-09	0.0000	1.110E-08	0.0001	8.005E-08	0.0005
U-235	4.677E-06	0.0316	1.811E-08	0.0001	1.467E-07	0.0010	2.596E-09	0.0000	1.135E-08	0.0001	8.184E-08	0.0006
U-238	9.633E-07	0.0065	1.711E-08	0.0001	1.812E-07	0.0012	3.207E-09	0.0000	1.402E-08	0.0001	1.011E-07	0.0007
Total	8.737E-05	0.5895	2.036E-07	0.0014	2.432E-05	0.1641	2.626E-06	0.0177	2.615E-06	0.0176	1.154E-06	0.0078

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 10
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.856E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.588E-07	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.029E-07	0.0014
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.011E-05	0.2032
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.725E-05	0.1164
H-3	0.000E+00	0.0000	0.000E+00	0.0000	3.923E-09	0.0000	1.923E-10	0.0000	5.703E-10	0.0000	3.528E-08	0.0002
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.546E-06	0.0374
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.958E-06	0.0537
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.072E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.883E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.563E-07	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-07	0.0020
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.310E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.735E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-06	0.0120	1.079E-05	0.0728	2.941E-06	0.0198	1.613E-05	0.1089
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	7.029E-06	0.0474	4.354E-06	0.0294	1.188E-06	0.0080	4.141E-05	0.2794
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.508E-05	0.1017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	1.698E-06	0.0115	5.028E-09	0.0000	1.336E-07	0.0009	6.657E-06	0.0449
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.367E-08	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.392E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.696E-07	0.0018
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.595E-07	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.937E-06	0.0333
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-06	0.0086
Total	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-05	0.0709	1.514E-05	0.1022	4.264E-06	0.0288	1.482E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 11
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.357E-07	0.0016	2.680E-08	0.0002	0.000E+00	0.0000	7.909E-08	0.0005	4.360E-10	0.0000	4.438E-11	0.0000	1.102E-07	0.0007
C-14	1.833E-12	0.0000	8.040E-11	0.0000	0.000E+00	0.0000	1.626E-07	0.0011	2.338E-08	0.0002	1.672E-08	0.0001	4.480E-11	0.0000
Co-60	2.970E-05	0.2004	2.072E-11	0.0000	0.000E+00	0.0000	3.037E-07	0.0020	8.757E-08	0.0006	1.881E-08	0.0001	5.295E-09	0.0000
Cs-137	1.605E-05	0.1083	6.099E-11	0.0000	0.000E+00	0.0000	6.759E-07	0.0046	3.170E-07	0.0021	1.846E-07	0.0012	2.357E-08	0.0002
H-3	0.000E+00	0.0000	4.426E-09	0.0000	0.000E+00	0.0000	2.154E-08	0.0001	1.844E-09	0.0000	2.790E-09	0.0000	4.414E-12	0.0000
I-129	4.824E-08	0.0003	1.027E-10	0.0000	0.000E+00	0.0000	3.433E-06	0.0232	4.347E-07	0.0029	1.390E-06	0.0094	2.393E-07	0.0016
Ni-63	0.000E+00	0.0000	3.803E-12	0.0000	0.000E+00	0.0000	2.601E-08	0.0002	1.969E-09	0.0000	1.710E-08	0.0001	7.255E-10	0.0000
Np-237	6.755E-06	0.0456	2.066E-08	0.0001	0.000E+00	0.0000	1.087E-06	0.0073	1.963E-08	0.0001	2.206E-10	0.0000	7.582E-08	0.0005
Pu-238	5.948E-10	0.0000	3.425E-08	0.0002	0.000E+00	0.0000	9.206E-08	0.0006	1.015E-09	0.0000	2.621E-11	0.0000	1.283E-07	0.0009
Pu-239	1.727E-09	0.0000	3.997E-08	0.0003	0.000E+00	0.0000	1.048E-07	0.0007	1.156E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0010
Pu-241	3.457E-09	0.0000	7.441E-10	0.0000	0.000E+00	0.0000	1.922E-09	0.0000	1.494E-11	0.0000	8.584E-13	0.0000	2.679E-09	0.0000
Se-79	3.711E-11	0.0000	5.595E-12	0.0000	0.000E+00	0.0000	2.268E-07	0.0015	3.253E-07	0.0022	6.930E-08	0.0005	3.153E-09	0.0000
Sn-126	2.879E-05	0.1943	1.161E-10	0.0000	0.000E+00	0.0000	2.295E-08	0.0002	1.200E-08	0.0001	2.958E-09	0.0000	1.276E-08	0.0001
Sr-90	1.230E-07	0.0008	2.335E-10	0.0000	0.000E+00	0.0000	1.278E-05	0.0862	1.383E-06	0.0093	7.325E-07	0.0049	5.943E-08	0.0004
Tc-99	2.739E-10	0.0000	1.071E-11	0.0000	0.000E+00	0.0000	4.681E-06	0.0316	6.267E-09	0.0000	1.315E-07	0.0009	1.302E-09	0.0000
U-233	2.066E-08	0.0001	2.070E-08	0.0001	0.000E+00	0.0000	1.461E-07	0.0010	2.582E-09	0.0000	1.127E-08	0.0001	8.195E-08	0.0006
U-234	2.235E-09	0.0000	2.013E-08	0.0001	0.000E+00	0.0000	1.435E-07	0.0010	2.539E-09	0.0000	1.110E-08	0.0001	8.005E-08	0.0005
U-235	4.678E-06	0.0316	1.813E-08	0.0001	0.000E+00	0.0000	1.471E-07	0.0010	2.639E-09	0.0000	1.135E-08	0.0001	8.192E-08	0.0006
U-238	9.633E-07	0.0065	1.711E-08	0.0001	0.000E+00	0.0000	1.812E-07	0.0012	3.207E-09	0.0000	1.402E-08	0.0001	1.011E-07	0.0007
Total	8.737E-05	0.5895	2.036E-07	0.0014	0.000E+00	0.0000	2.432E-05	0.1641	2.626E-06	0.0177	2.615E-06	0.0176	1.154E-06	0.0078

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 12
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.523E-07	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.029E-07	0.0014
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.011E-05	0.2032
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.725E-05	0.1164
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.923E-09	0.0000	1.923E-10	0.0000	5.703E-10	0.0000	3.528E-08	0.0002
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.546E-06	0.0374
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.580E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.958E-06	0.0537
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.563E-07	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-07	0.0020
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.818E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.783E-06	0.0120	1.079E-05	0.0728	2.941E-06	0.0198	1.613E-05	0.1089
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.029E-06	0.0474	4.354E-06	0.0294	1.188E-06	0.0080	4.141E-05	0.2794
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.508E-05	0.1017
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.698E-06	0.0115	5.028E-09	0.0000	1.336E-07	0.0009	6.657E-06	0.0449
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.833E-07	0.0019
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.596E-07	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.939E-06	0.0333
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-06	0.0086
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-05	0.0709	1.514E-05	0.1022	4.264E-06	0.0288	1.482E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 13
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	9.305E-09	2.339E-05	8.948E-07	5.664E-08	1.077E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.511E-05
Am-241	2.793E-02	2.319E+01	1.278E-01	1.301E-02	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.566E+01
C-14	1.543E+01	2.804E+04	4.191E+03	2.956E+03	7.636E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.520E+04
Co-60	2.448E-02	1.625E+03	4.687E+02	1.007E+02	2.834E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.223E+03
Cs-137	2.729E-02	9.057E+02	4.247E+02	2.473E+02	3.158E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.609E+03
H-3	1.911E+03	5.527E+04	4.833E+03	7.258E+03	1.126E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.737E+04
I-129	2.766E-02	4.594E+02	5.817E+01	1.861E+02	3.202E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.356E+02
Ni-63	2.772E-02	1.150E+03	8.710E+01	7.561E+02	3.208E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.025E+03
Np-237	2.791E-02	4.632E+02	8.366E+00	9.371E-02	3.230E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.040E+02
Pa-231	5.909E-07	4.769E-03	5.023E-04	1.495E-06	6.839E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.957E-03
Pb-210	5.598E-13	6.044E-09	1.414E-10	1.092E-10	6.479E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.943E-09
Pu-238	2.771E-02	2.301E+01	2.537E-01	6.455E-03	3.207E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.534E+01
Pu-239	2.793E-02	2.319E+01	2.557E-01	6.506E-03	3.233E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.578E+01
Pu-241	2.662E-02	2.210E+01	2.437E-01	6.200E-03	3.081E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.316E+01
Ra-226	5.445E-11	1.682E-06	2.025E-08	5.008E-08	6.302E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.816E-06
Se-79	2.554E-02	2.126E+03	3.049E+03	6.496E+02	2.955E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.854E+03
Sn-126	2.554E-02	5.315E+01	2.779E+01	6.850E+00	2.955E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.173E+02
Sr-90	2.726E-02	6.786E+03	7.344E+02	3.890E+02	3.155E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.941E+03
Tc-99	2.554E-02	1.063E+05	1.423E+02	2.985E+03	2.955E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.094E+05
Th-229	2.637E-06	2.309E-03	2.866E-05	4.279E-06	3.052E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.394E-03
Th-230	2.514E-07	2.201E-04	2.732E-06	4.079E-07	2.910E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.142E-04
U-233	2.793E-02	5.794E+01	1.025E+00	4.483E+00	3.232E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.577E+01
U-234	2.793E-02	5.794E+01	1.025E+00	4.483E+00	3.232E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.577E+01
U-235	2.793E-02	5.794E+01	1.025E+00	4.483E+00	3.232E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.577E+01
U-238	2.793E-02	5.794E+01	1.025E+00	4.483E+00	3.232E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.577E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 14
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.666E-10	0.0000	1.067E-11	0.0000	6.891E-11	0.0000	3.009E-13	0.0000	1.770E-13	0.0000	3.788E-11	0.0000
Am-241	2.389E-07	0.0017	2.716E-08	0.0002	8.016E-08	0.0006	4.419E-10	0.0000	4.498E-11	0.0000	1.117E-07	0.0008
C-14	4.331E-13	0.0000	1.899E-11	0.0000	3.887E-08	0.0003	5.809E-09	0.0000	4.098E-09	0.0000	1.058E-11	0.0000
Co-60	2.603E-05	0.1813	1.816E-11	0.0000	2.662E-07	0.0019	7.676E-08	0.0005	1.649E-08	0.0001	4.641E-09	0.0000
Cs-137	1.568E-05	0.1092	5.958E-11	0.0000	6.603E-07	0.0046	3.097E-07	0.0022	1.803E-07	0.0013	2.303E-08	0.0002
H-3	0.000E+00	0.0000	1.542E-09	0.0000	7.546E-09	0.0001	6.599E-10	0.0000	9.910E-10	0.0000	1.538E-12	0.0000
I-129	4.777E-08	0.0003	1.017E-10	0.0000	3.400E-06	0.0237	4.305E-07	0.0030	1.377E-06	0.0096	2.370E-07	0.0017
Ni-63	0.000E+00	0.0000	3.774E-12	0.0000	2.581E-08	0.0002	1.955E-09	0.0000	1.697E-08	0.0001	7.200E-10	0.0000
Np-237	6.750E-06	0.0470	2.064E-08	0.0001	1.086E-06	0.0076	1.962E-08	0.0001	2.198E-10	0.0000	7.576E-08	0.0005
Pa-231	3.501E-10	0.0000	1.633E-11	0.0000	4.010E-10	0.0000	4.568E-11	0.0000	1.078E-13	0.0000	5.604E-11	0.0000
Pb-210	3.179E-15	0.0000	1.957E-15	0.0000	1.852E-12	0.0000	3.528E-14	0.0000	3.002E-14	0.0000	2.536E-13	0.0000
Pu-238	5.900E-10	0.0000	3.397E-08	0.0002	9.133E-08	0.0006	1.007E-09	0.0000	2.562E-11	0.0000	1.273E-07	0.0009
Pu-239	1.727E-09	0.0000	3.997E-08	0.0003	1.048E-07	0.0007	1.155E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0010
Pu-241	6.269E-11	0.0000	3.417E-10	0.0000	7.470E-10	0.0000	8.236E-12	0.0000	2.096E-13	0.0000	1.041E-09	0.0000
Ra-226	3.525E-11	0.0000	1.005E-14	0.0000	6.047E-12	0.0000	9.327E-14	0.0000	2.049E-13	0.0000	2.117E-13	0.0000
Se-79	3.393E-11	0.0000	5.115E-12	0.0000	2.073E-07	0.0014	2.974E-07	0.0021	6.336E-08	0.0004	2.883E-09	0.0000
Sn-126	2.632E-05	0.1833	1.061E-10	0.0000	2.098E-08	0.0001	1.097E-08	0.0001	2.704E-09	0.0000	1.167E-08	0.0001
Sr-90	1.201E-07	0.0008	2.279E-10	0.0000	1.247E-05	0.0869	1.350E-06	0.0094	7.150E-07	0.0050	5.800E-08	0.0004
Tc-99	2.504E-10	0.0000	9.794E-12	0.0000	4.280E-06	0.0298	5.731E-09	0.0000	1.202E-07	0.0008	1.190E-09	0.0000
Th-229	1.312E-08	0.0001	2.200E-10	0.0000	5.714E-10	0.0000	6.360E-12	0.0000	8.209E-13	0.0000	7.935E-10	0.0000
Th-230	8.940E-13	0.0000	3.106E-12	0.0000	9.060E-12	0.0000	1.008E-13	0.0000	1.301E-14	0.0000	1.258E-11	0.0000
U-233	8.474E-09	0.0001	2.049E-08	0.0001	1.456E-07	0.0010	2.576E-09	0.0000	1.126E-08	0.0001	8.120E-08	0.0006
U-234	2.202E-09	0.0000	2.013E-08	0.0001	1.435E-07	0.0010	2.539E-09	0.0000	1.110E-08	0.0001	8.003E-08	0.0006
U-235	4.676E-06	0.0326	1.810E-08	0.0001	1.467E-07	0.0010	2.595E-09	0.0000	1.135E-08	0.0001	8.182E-08	0.0006
U-238	9.631E-07	0.0067	1.711E-08	0.0001	1.812E-07	0.0013	3.206E-09	0.0000	1.402E-08	0.0001	1.011E-07	0.0007
Total	8.085E-05	0.5632	2.003E-07	0.0014	2.336E-05	0.1627	2.523E-06	0.0176	2.545E-06	0.0177	1.146E-06	0.0080

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 15
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.845E-10	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.584E-07	0.0032
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.881E-08	0.0003
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.640E-05	0.1838
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.685E-05	0.1174
H-3	0.000E+00	0.0000	0.000E+00	0.0000	3.927E-09	0.0000	1.925E-10	0.0000	5.709E-10	0.0000	1.543E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.492E-06	0.0383
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.546E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.953E-06	0.0554
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.692E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.176E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.542E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-07	0.0020
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.201E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.960E-06	0.0137	1.189E-05	0.0828	3.237E-06	0.0225	1.765E-05	0.1230
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	7.727E-06	0.0538	4.798E-06	0.0334	1.308E-06	0.0091	4.020E-05	0.2800
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-05	0.1025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	1.866E-06	0.0130	5.541E-09	0.0000	1.471E-07	0.0010	6.426E-06	0.0448
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-08	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.575E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.696E-07	0.0019
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.595E-07	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.936E-06	0.0344
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-06	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-05	0.0805	1.669E-05	0.1162	4.692E-06	0.0327	1.436E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 16
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.353E-07	0.0016	2.675E-08	0.0002	0.000E+00	0.0000	7.896E-08	0.0005	4.353E-10	0.0000	4.430E-11	0.0000	1.101E-07	0.0008
C-14	4.331E-13	0.0000	1.899E-11	0.0000	0.000E+00	0.0000	3.887E-08	0.0003	5.809E-09	0.0000	4.098E-09	0.0000	1.058E-11	0.0000
Co-60	2.603E-05	0.1813	1.816E-11	0.0000	0.000E+00	0.0000	2.662E-07	0.0019	7.676E-08	0.0005	1.649E-08	0.0001	4.641E-09	0.0000
Cs-137	1.568E-05	0.1092	5.958E-11	0.0000	0.000E+00	0.0000	6.603E-07	0.0046	3.097E-07	0.0022	1.803E-07	0.0013	2.303E-08	0.0002
H-3	0.000E+00	0.0000	1.542E-09	0.0000	0.000E+00	0.0000	7.546E-09	0.0001	6.599E-10	0.0000	9.910E-10	0.0000	1.538E-12	0.0000
I-129	4.777E-08	0.0003	1.017E-10	0.0000	0.000E+00	0.0000	3.400E-06	0.0237	4.305E-07	0.0030	1.377E-06	0.0096	2.370E-07	0.0017
Ni-63	0.000E+00	0.0000	3.774E-12	0.0000	0.000E+00	0.0000	2.581E-08	0.0002	1.955E-09	0.0000	1.697E-08	0.0001	7.200E-10	0.0000
Np-237	6.750E-06	0.0470	2.065E-08	0.0001	0.000E+00	0.0000	1.086E-06	0.0076	1.962E-08	0.0001	2.204E-10	0.0000	7.576E-08	0.0005
Pu-238	5.901E-10	0.0000	3.398E-08	0.0002	0.000E+00	0.0000	9.133E-08	0.0006	1.007E-09	0.0000	2.603E-11	0.0000	1.273E-07	0.0009
Pu-239	1.727E-09	0.0000	3.997E-08	0.0003	0.000E+00	0.0000	1.048E-07	0.0007	1.155E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0010
Pu-241	3.663E-09	0.0000	7.511E-10	0.0000	0.000E+00	0.0000	1.955E-09	0.0000	1.492E-11	0.0000	8.874E-13	0.0000	2.725E-09	0.0000
Se-79	3.393E-11	0.0000	5.115E-12	0.0000	0.000E+00	0.0000	2.073E-07	0.0014	2.974E-07	0.0021	6.336E-08	0.0004	2.883E-09	0.0000
Sn-126	2.632E-05	0.1833	1.061E-10	0.0000	0.000E+00	0.0000	2.098E-08	0.0001	1.097E-08	0.0001	2.704E-09	0.0000	1.167E-08	0.0001
Sr-90	1.201E-07	0.0008	2.279E-10	0.0000	0.000E+00	0.0000	1.247E-05	0.0869	1.350E-06	0.0094	7.150E-07	0.0050	5.800E-08	0.0004
Tc-99	2.504E-10	0.0000	9.794E-12	0.0000	0.000E+00	0.0000	4.280E-06	0.0298	5.731E-09	0.0000	1.202E-07	0.0008	1.190E-09	0.0000
U-233	2.160E-08	0.0002	2.071E-08	0.0001	0.000E+00	0.0000	1.461E-07	0.0010	2.582E-09	0.0000	1.126E-08	0.0001	8.199E-08	0.0006
U-234	2.238E-09	0.0000	2.013E-08	0.0001	0.000E+00	0.0000	1.435E-07	0.0010	2.539E-09	0.0000	1.110E-08	0.0001	8.004E-08	0.0006
U-235	4.677E-06	0.0326	1.813E-08	0.0001	0.000E+00	0.0000	1.471E-07	0.0010	2.641E-09	0.0000	1.135E-08	0.0001	8.191E-08	0.0006
U-238	9.631E-07	0.0067	1.711E-08	0.0001	0.000E+00	0.0000	1.812E-07	0.0013	3.206E-09	0.0000	1.402E-08	0.0001	1.011E-07	0.0007
Total	8.085E-05	0.5632	2.003E-07	0.0014	0.000E+00	0.0000	2.336E-05	0.1627	2.523E-06	0.0176	2.545E-06	0.0177	1.146E-06	0.0080

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 17
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.515E-07	0.0031
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.881E-08	0.0003
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.640E-05	0.1838
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.685E-05	0.1174
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.927E-09	0.0000	1.925E-10	0.0000	5.709E-10	0.0000	1.543E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.492E-06	0.0383
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.546E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.953E-06	0.0554
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.542E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-07	0.0020
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.110E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.960E-06	0.0137	1.189E-05	0.0828	3.237E-06	0.0225	1.765E-05	0.1230
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.727E-06	0.0538	4.798E-06	0.0334	1.308E-06	0.0091	4.020E-05	0.2800
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.472E-05	0.1025
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.866E-06	0.0130	5.541E-09	0.0000	1.471E-07	0.0010	6.426E-06	0.0448
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.843E-07	0.0020
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.595E-07	0.0018
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.938E-06	0.0344
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.280E-06	0.0089
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.156E-05	0.0805	1.669E-05	0.1162	4.692E-06	0.0327	1.436E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 18
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.195E-08	1.826E-04	3.010E-06	4.611E-07	9.485E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.809E-04
Am-241	2.792E-02	2.318E+01	1.278E-01	1.301E-02	3.231E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.563E+01
C-14	8.592E-01	1.562E+03	2.334E+02	1.646E+02	4.252E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.960E+03
Co-60	1.881E-02	1.249E+03	3.601E+02	7.737E+01	2.178E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.708E+03
Cs-137	2.604E-02	8.644E+02	4.054E+02	2.361E+02	3.014E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E+03
H-3	2.317E+02	6.701E+03	5.860E+02	8.801E+02	1.366E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.169E+03
I-129	2.713E-02	4.505E+02	5.706E+01	1.825E+02	3.140E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.215E+02
Ni-63	2.730E-02	1.133E+03	8.579E+01	7.447E+02	3.160E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.995E+03
Np-237	2.787E-02	4.625E+02	8.354E+00	9.357E-02	3.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.032E+02
Pa-231	1.772E-06	1.457E-02	1.625E-03	4.097E-06	2.051E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.825E-02
Pb-210	1.488E-11	1.368E-07	2.956E-09	2.357E-09	1.722E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.593E-07
Pu-238	2.727E-02	2.264E+01	2.497E-01	6.353E-03	3.157E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.447E+01
Pu-239	2.792E-02	2.319E+01	2.556E-01	6.505E-03	3.232E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.577E+01
Pu-241	2.417E-02	2.007E+01	2.213E-01	5.631E-03	2.798E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.827E+01
Ra-226	4.898E-10	1.587E-05	2.286E-07	5.185E-07	5.669E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.719E-05
Se-79	2.134E-02	1.777E+03	2.549E+03	5.429E+02	2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.893E+03
Sn-126	2.134E-02	4.443E+01	2.322E+01	5.725E+00	2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.808E+01
Sr-90	2.597E-02	6.465E+03	6.997E+02	3.706E+02	3.006E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.565E+03
Tc-99	2.134E-02	8.883E+04	1.190E+02	2.495E+03	2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.147E+04
Th-229	7.909E-06	6.686E-03	7.692E-05	1.042E-05	9.154E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.593E-02
Th-230	7.541E-07	6.374E-04	7.333E-06	9.933E-07	8.727E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.519E-03
U-233	2.791E-02	5.792E+01	1.025E+00	4.481E+00	3.231E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.573E+01
U-234	2.791E-02	5.792E+01	1.025E+00	4.481E+00	3.231E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.573E+01
U-235	2.791E-02	5.792E+01	1.025E+00	4.481E+00	3.231E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.573E+01
U-238	2.791E-02	5.792E+01	1.025E+00	4.481E+00	3.231E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.573E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 19
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.057E-09	0.0000	1.301E-11	0.0000	8.398E-11	0.0000	3.495E-13	0.0000	2.157E-13	0.0000	4.621E-11	0.0000
Am-241	2.385E-07	0.0018	2.712E-08	0.0002	8.003E-08	0.0006	4.412E-10	0.0000	4.491E-11	0.0000	1.116E-07	0.0008
C-14	2.410E-14	0.0000	1.057E-12	0.0000	2.163E-09	0.0000	3.233E-10	0.0000	2.280E-10	0.0000	5.888E-13	0.0000
Co-60	2.000E-05	0.1471	1.396E-11	0.0000	2.045E-07	0.0015	5.898E-08	0.0004	1.267E-08	0.0001	3.567E-09	0.0000
Cs-137	1.496E-05	0.1101	5.687E-11	0.0000	6.303E-07	0.0046	2.956E-07	0.0022	1.721E-07	0.0013	2.198E-08	0.0002
H-3	0.000E+00	0.0000	1.868E-10	0.0000	9.142E-10	0.0000	7.995E-11	0.0000	1.201E-10	0.0000	1.863E-13	0.0000
I-129	4.685E-08	0.0003	9.978E-11	0.0000	3.334E-06	0.0245	4.223E-07	0.0031	1.351E-06	0.0099	2.324E-07	0.0017
Ni-63	0.000E+00	0.0000	3.718E-12	0.0000	2.542E-08	0.0002	1.925E-09	0.0000	1.671E-08	0.0001	7.092E-10	0.0000
Np-237	6.740E-06	0.0496	2.062E-08	0.0002	1.085E-06	0.0080	1.959E-08	0.0001	2.194E-10	0.0000	7.565E-08	0.0006
Pa-231	4.000E-10	0.0000	1.865E-11	0.0000	4.582E-10	0.0000	5.224E-11	0.0000	1.230E-13	0.0000	6.402E-11	0.0000
Pb-210	4.182E-15	0.0000	2.575E-15	0.0000	2.434E-12	0.0000	4.626E-14	0.0000	3.941E-14	0.0000	3.336E-13	0.0000
Pu-238	5.807E-10	0.0000	3.344E-08	0.0002	8.989E-08	0.0007	9.910E-10	0.0000	2.522E-11	0.0000	1.253E-07	0.0009
Pu-239	1.727E-09	0.0000	3.996E-08	0.0003	1.048E-07	0.0008	1.155E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0011
Pu-241	5.693E-11	0.0000	3.103E-10	0.0000	6.784E-10	0.0000	7.479E-12	0.0000	1.903E-13	0.0000	9.456E-10	0.0000
Ra-226	4.362E-11	0.0000	1.243E-14	0.0000	7.484E-12	0.0000	1.156E-13	0.0000	2.538E-13	0.0000	2.620E-13	0.0000
Se-79	2.836E-11	0.0000	4.275E-12	0.0000	1.733E-07	0.0013	2.486E-07	0.0018	5.296E-08	0.0004	2.409E-09	0.0000
Sn-126	2.200E-05	0.1618	8.869E-11	0.0000	1.754E-08	0.0001	9.168E-09	0.0001	2.260E-09	0.0000	9.752E-09	0.0001
Sr-90	1.144E-07	0.0008	2.171E-10	0.0000	1.188E-05	0.0874	1.286E-06	0.0095	6.812E-07	0.0050	5.526E-08	0.0004
Tc-99	2.093E-10	0.0000	8.186E-12	0.0000	3.577E-06	0.0263	4.790E-09	0.0000	1.005E-07	0.0007	9.947E-10	0.0000
Th-229	1.500E-08	0.0001	2.514E-10	0.0000	6.526E-10	0.0000	7.255E-12	0.0000	9.348E-13	0.0000	9.066E-10	0.0000
Th-230	1.022E-12	0.0000	3.549E-12	0.0000	1.035E-11	0.0000	1.150E-13	0.0000	1.482E-14	0.0000	1.438E-11	0.0000
U-233	8.471E-09	0.0001	2.048E-08	0.0002	1.455E-07	0.0011	2.575E-09	0.0000	1.126E-08	0.0001	8.117E-08	0.0006
U-234	2.201E-09	0.0000	2.012E-08	0.0001	1.434E-07	0.0011	2.537E-09	0.0000	1.110E-08	0.0001	8.000E-08	0.0006
U-235	4.674E-06	0.0344	1.809E-08	0.0001	1.466E-07	0.0011	2.594E-09	0.0000	1.134E-08	0.0001	8.179E-08	0.0006
U-238	9.626E-07	0.0071	1.710E-08	0.0001	1.811E-07	0.0013	3.205E-09	0.0000	1.401E-08	0.0001	1.010E-07	0.0007
Total	6.977E-05	0.5132	1.982E-07	0.0015	2.183E-05	0.1606	2.361E-06	0.0174	2.437E-06	0.0179	1.132E-06	0.0083

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 20
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.201E-09	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.577E-07	0.0034
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-05	0.1492
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-05	0.1183
H-3	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-09	0.0000	1.925E-10	0.0000	5.708E-10	0.0000	5.991E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.387E-06	0.0396
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.477E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.941E-06	0.0584
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.932E-10	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.860E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-07	0.0022
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.999E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.175E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	2.270E-06	0.0167	1.381E-05	0.1016	3.754E-06	0.0276	2.031E-05	0.1494
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	8.948E-06	0.0658	5.575E-06	0.0410	1.516E-06	0.0112	3.808E-05	0.2801
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-05	0.1031
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-06	0.0159	6.438E-09	0.0000	1.706E-07	0.0013	6.022E-06	0.0443
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.681E-08	0.0001
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.942E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.695E-07	0.0020
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.594E-07	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.934E-06	0.0363
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-06	0.0094
Total	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-05	0.0984	1.939E-05	0.1426	5.441E-06	0.0400	1.359E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 21
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File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.345E-07	0.0017	2.666E-08	0.0002	0.000E+00	0.0000	7.870E-08	0.0006	4.339E-10	0.0000	4.416E-11	0.0000	1.097E-07	0.0008
C-14	2.410E-14	0.0000	1.057E-12	0.0000	0.000E+00	0.0000	2.163E-09	0.0000	3.233E-10	0.0000	2.280E-10	0.0000	5.888E-13	0.0000
Co-60	2.000E-05	0.1471	1.396E-11	0.0000	0.000E+00	0.0000	2.045E-07	0.0015	5.898E-08	0.0004	1.267E-08	0.0001	3.567E-09	0.0000
Cs-137	1.496E-05	0.1101	5.687E-11	0.0000	0.000E+00	0.0000	6.303E-07	0.0046	2.956E-07	0.0022	1.721E-07	0.0013	2.198E-08	0.0002
H-3	0.000E+00	0.0000	1.868E-10	0.0000	0.000E+00	0.0000	9.142E-10	0.0000	7.995E-11	0.0000	1.201E-10	0.0000	1.863E-13	0.0000
I-129	4.685E-08	0.0003	9.978E-11	0.0000	0.000E+00	0.0000	3.334E-06	0.0245	4.223E-07	0.0031	1.351E-06	0.0099	2.324E-07	0.0017
Ni-63	0.000E+00	0.0000	3.718E-12	0.0000	0.000E+00	0.0000	2.542E-08	0.0002	1.925E-09	0.0000	1.671E-08	0.0001	7.092E-10	0.0000
Np-237	6.740E-06	0.0496	2.062E-08	0.0002	0.000E+00	0.0000	1.085E-06	0.0080	1.959E-08	0.0001	2.202E-10	0.0000	7.565E-08	0.0006
Pu-238	5.808E-10	0.0000	3.344E-08	0.0002	0.000E+00	0.0000	8.989E-08	0.0007	9.911E-10	0.0000	2.568E-11	0.0000	1.253E-07	0.0009
Pu-239	1.727E-09	0.0000	3.996E-08	0.0003	0.000E+00	0.0000	1.048E-07	0.0008	1.155E-09	0.0000	2.940E-11	0.0000	1.461E-07	0.0011
Pu-241	4.045E-09	0.0000	7.637E-10	0.0000	0.000E+00	0.0000	2.017E-09	0.0000	1.488E-11	0.0000	9.411E-13	0.0000	2.811E-09	0.0000
Se-79	2.836E-11	0.0000	4.275E-12	0.0000	0.000E+00	0.0000	1.733E-07	0.0013	2.486E-07	0.0018	5.296E-08	0.0004	2.409E-09	0.0000
Sn-126	2.200E-05	0.1618	8.869E-11	0.0000	0.000E+00	0.0000	1.754E-08	0.0001	9.168E-09	0.0001	2.260E-09	0.0000	9.752E-09	0.0001
Sr-90	1.144E-07	0.0008	2.171E-10	0.0000	0.000E+00	0.0000	1.188E-05	0.0874	1.286E-06	0.0095	6.812E-07	0.0050	5.526E-08	0.0004
Tc-99	2.093E-10	0.0000	8.186E-12	0.0000	0.000E+00	0.0000	3.577E-06	0.0263	4.790E-09	0.0000	1.005E-07	0.0007	9.947E-10	0.0000
U-233	2.346E-08	0.0002	2.073E-08	0.0002	0.000E+00	0.0000	1.461E-07	0.0011	2.582E-09	0.0000	1.126E-08	0.0001	8.207E-08	0.0006
U-234	2.246E-09	0.0000	2.012E-08	0.0001	0.000E+00	0.0000	1.434E-07	0.0011	2.538E-09	0.0000	1.110E-08	0.0001	8.000E-08	0.0006
U-235	4.675E-06	0.0344	1.813E-08	0.0001	0.000E+00	0.0000	1.472E-07	0.0011	2.647E-09	0.0000	1.134E-08	0.0001	8.190E-08	0.0006
U-238	9.626E-07	0.0071	1.710E-08	0.0001	0.000E+00	0.0000	1.811E-07	0.0013	3.205E-09	0.0000	1.401E-08	0.0001	1.010E-07	0.0007
Total	6.977E-05	0.5132	1.982E-07	0.0015	0.000E+00	0.0000	2.183E-05	0.1606	2.361E-06	0.0174	2.437E-06	0.0179	1.132E-06	0.0083

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 22
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.501E-07	0.0033
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.716E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.028E-05	0.1492
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.608E-05	0.1183
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-09	0.0000	1.925E-10	0.0000	5.708E-10	0.0000	5.991E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.387E-06	0.0396
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.477E-08	0.0003
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.941E-06	0.0584
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.502E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.937E-07	0.0022
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.652E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.270E-06	0.0167	1.381E-05	0.1016	3.754E-06	0.0276	2.031E-05	0.1494
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.948E-06	0.0658	5.575E-06	0.0410	1.516E-06	0.0112	3.808E-05	0.2801
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-05	0.1031
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.161E-06	0.0159	6.438E-09	0.0000	1.706E-07	0.0013	6.022E-06	0.0443
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.862E-07	0.0021
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.594E-07	0.0019
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.936E-06	0.0363
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.279E-06	0.0094
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.338E-05	0.0984	1.939E-05	0.1426	5.441E-06	0.0400	1.359E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 23
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.456E-07	1.797E-03	1.150E-05	4.602E-06	9.787E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.791E-03
Am-241	2.782E-02	2.310E+01	1.274E-01	1.296E-02	3.220E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.545E+01
C-14	3.432E-05	6.239E-02	9.330E-03	6.579E-03	1.698E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.831E-02
Co-60	7.483E-03	4.967E+02	1.432E+02	3.077E+01	8.660E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.793E+02
Cs-137	2.212E-02	7.342E+02	3.443E+02	2.005E+02	2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.305E+03
H-3	1.420E-01	4.107E+00	3.593E-01	5.395E-01	8.368E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.007E+00
I-129	2.535E-02	4.210E+02	5.332E+01	1.705E+02	2.934E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.742E+02
Ni-63	2.589E-02	1.074E+03	8.135E+01	7.062E+02	2.997E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.892E+03
Np-237	2.773E-02	4.602E+02	8.312E+00	9.310E-02	3.210E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.007E+02
Pa-231	5.896E-06	4.879E-02	5.547E-03	1.318E-05	6.825E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.118E-02
Pb-210	5.218E-10	4.481E-06	8.786E-08	7.362E-08	6.040E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.246E-06
Pu-238	2.580E-02	2.142E+01	2.361E-01	6.009E-03	2.986E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.152E+01
Pu-239	2.791E-02	2.317E+01	2.555E-01	6.501E-03	3.230E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.574E+01
Pu-241	1.725E-02	1.432E+01	1.579E-01	4.019E-03	1.997E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.445E+01
Ra-226	5.432E-09	1.790E-04	2.731E-06	6.031E-06	6.287E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.940E-04
Se-79	1.139E-02	9.482E+02	1.360E+03	2.898E+02	1.318E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.611E+03
Sn-126	1.139E-02	2.371E+01	1.239E+01	3.056E+00	1.318E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.235E+01
Sr-90	2.192E-02	5.456E+03	5.905E+02	3.127E+02	2.537E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.385E+03
Tc-99	1.139E-02	4.741E+04	6.349E+01	1.332E+03	1.318E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.882E+04
Th-229	2.634E-05	2.199E-02	2.456E-04	3.188E-05	3.048E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.274E-02
Th-230	2.512E-06	2.097E-03	2.342E-05	3.040E-06	2.907E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.030E-03
U-233	2.787E-02	5.783E+01	1.023E+00	4.474E+00	3.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.558E+01
U-234	2.787E-02	5.783E+01	1.023E+00	4.475E+00	3.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.559E+01
U-235	2.787E-02	5.783E+01	1.023E+00	4.474E+00	3.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.558E+01
U-238	2.787E-02	5.783E+01	1.023E+00	4.474E+00	3.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.558E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 24
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.877E-09	0.0000	2.311E-11	0.0000	1.488E-10	0.0000	5.319E-13	0.0000	3.824E-13	0.0000	8.206E-11	0.0000
Am-241	2.369E-07	0.0020	2.693E-08	0.0002	7.948E-08	0.0007	4.382E-10	0.0000	4.460E-11	0.0000	1.108E-07	0.0009
C-14	9.596E-19	0.0000	4.208E-17	0.0000	8.614E-14	0.0000	1.288E-14	0.0000	9.084E-15	0.0000	2.345E-17	0.0000
Co-60	7.955E-06	0.0669	5.551E-12	0.0000	8.135E-08	0.0007	2.346E-08	0.0002	5.040E-09	0.0000	1.418E-09	0.0000
Cs-137	1.271E-05	0.1068	4.830E-11	0.0000	5.353E-07	0.0045	2.510E-07	0.0021	1.462E-07	0.0012	1.867E-08	0.0002
H-3	0.000E+00	0.0000	1.142E-13	0.0000	5.588E-13	0.0000	4.889E-14	0.0000	7.341E-14	0.0000	1.139E-16	0.0000
I-129	4.378E-08	0.0004	9.324E-11	0.0000	3.116E-06	0.0262	3.946E-07	0.0033	1.262E-06	0.0106	2.172E-07	0.0018
Ni-63	0.000E+00	0.0000	3.526E-12	0.0000	2.411E-08	0.0002	1.826E-09	0.0000	1.585E-08	0.0001	6.725E-10	0.0000
Np-237	6.707E-06	0.0564	2.051E-08	0.0002	1.079E-06	0.0091	1.949E-08	0.0002	2.183E-10	0.0000	7.527E-08	0.0006
Pa-231	5.742E-10	0.0000	2.677E-11	0.0000	6.581E-10	0.0000	7.515E-11	0.0000	1.761E-13	0.0000	9.191E-11	0.0000
Pb-210	9.483E-15	0.0000	5.838E-15	0.0000	5.502E-12	0.0000	1.039E-13	0.0000	8.886E-14	0.0000	7.564E-13	0.0000
Pu-238	5.493E-10	0.0000	3.163E-08	0.0003	8.502E-08	0.0007	9.373E-10	0.0000	2.385E-11	0.0000	1.185E-07	0.0010
Pu-239	1.726E-09	0.0000	3.994E-08	0.0003	1.047E-07	0.0009	1.155E-09	0.0000	2.938E-11	0.0000	1.460E-07	0.0012
Pu-241	4.063E-11	0.0000	2.215E-10	0.0000	4.841E-10	0.0000	5.338E-12	0.0000	1.358E-13	0.0000	6.749E-10	0.0000
Ra-226	8.162E-11	0.0000	2.326E-14	0.0000	1.402E-11	0.0000	2.170E-13	0.0000	4.760E-13	0.0000	4.902E-13	0.0000
Se-79	1.514E-11	0.0000	2.282E-12	0.0000	9.249E-08	0.0008	1.327E-07	0.0011	2.826E-08	0.0002	1.286E-09	0.0000
Sn-126	1.174E-05	0.0987	4.734E-11	0.0000	9.361E-09	0.0001	4.893E-09	0.0000	1.206E-09	0.0000	5.205E-09	0.0000
Sr-90	9.652E-08	0.0008	1.832E-10	0.0000	1.003E-05	0.0843	1.086E-06	0.0091	5.749E-07	0.0048	4.664E-08	0.0004
Tc-99	1.117E-10	0.0000	4.369E-12	0.0000	1.909E-06	0.0160	2.557E-09	0.0000	5.363E-08	0.0005	5.309E-10	0.0000
Th-229	2.154E-08	0.0002	3.610E-10	0.0000	9.363E-10	0.0000	1.038E-11	0.0000	1.333E-12	0.0000	1.302E-09	0.0000
Th-230	1.468E-12	0.0000	5.098E-12	0.0000	1.485E-11	0.0000	1.647E-13	0.0000	2.114E-14	0.0000	2.065E-11	0.0000
U-233	8.458E-09	0.0001	2.045E-08	0.0002	1.453E-07	0.0012	2.571E-09	0.0000	1.124E-08	0.0001	8.104E-08	0.0007
U-234	2.198E-09	0.0000	2.009E-08	0.0002	1.432E-07	0.0012	2.534E-09	0.0000	1.108E-08	0.0001	7.988E-08	0.0007
U-235	4.667E-06	0.0392	1.807E-08	0.0002	1.464E-07	0.0012	2.590E-09	0.0000	1.133E-08	0.0001	8.166E-08	0.0007
U-238	9.612E-07	0.0081	1.708E-08	0.0001	1.808E-07	0.0015	3.200E-09	0.0000	1.399E-08	0.0001	1.009E-07	0.0008
Total	4.516E-05	0.3795	1.957E-07	0.0016	1.776E-05	0.1493	1.930E-06	0.0162	2.135E-06	0.0179	1.088E-06	0.0091

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 25
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.132E-09	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.545E-07	0.0038
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.082E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.066E-06	0.0678
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-05	0.1148
H-3	0.000E+00	0.0000	0.000E+00	0.0000	3.928E-09	0.0000	1.926E-10	0.0000	5.710E-10	0.0000	4.692E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.034E-06	0.0423
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.246E-08	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.901E-06	0.0664
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-09	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.466E-12	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.367E-07	0.0020
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-07	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.427E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.684E-11	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-06	0.0252	1.837E-05	0.1544	4.979E-06	0.0418	2.661E-05	0.2236
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-05	0.0995	7.417E-06	0.0623	2.011E-06	0.0169	3.303E-05	0.2776
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-05	0.0994
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-06	0.0240	8.566E-09	0.0001	2.263E-07	0.0019	5.062E-06	0.0425
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.415E-08	0.0002
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.225E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.690E-07	0.0023
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.590E-07	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.927E-06	0.0414
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.277E-06	0.0107
Total	0.000E+00	0.0000	0.000E+00	0.0000	1.771E-05	0.1489	2.580E-05	0.2168	7.218E-06	0.0607	1.190E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 26
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.318E-07	0.0019	2.636E-08	0.0002	0.000E+00	0.0000	7.779E-08	0.0007	4.289E-10	0.0000	4.365E-11	0.0000	1.084E-07	0.0009
C-14	9.596E-19	0.0000	4.208E-17	0.0000	0.000E+00	0.0000	8.614E-14	0.0000	1.288E-14	0.0000	9.084E-15	0.0000	2.345E-17	0.0000
Co-60	7.955E-06	0.0669	5.551E-12	0.0000	0.000E+00	0.0000	8.135E-08	0.0007	2.346E-08	0.0002	5.040E-09	0.0000	1.418E-09	0.0000
Cs-137	1.271E-05	0.1068	4.830E-11	0.0000	0.000E+00	0.0000	5.353E-07	0.0045	2.510E-07	0.0021	1.462E-07	0.0012	1.867E-08	0.0002
H-3	0.000E+00	0.0000	1.142E-13	0.0000	0.000E+00	0.0000	5.588E-13	0.0000	4.889E-14	0.0000	7.341E-14	0.0000	1.139E-16	0.0000
I-129	4.378E-08	0.0004	9.324E-11	0.0000	0.000E+00	0.0000	3.116E-06	0.0262	3.946E-07	0.0033	1.262E-06	0.0106	2.172E-07	0.0018
Ni-63	0.000E+00	0.0000	3.526E-12	0.0000	0.000E+00	0.0000	2.411E-08	0.0002	1.826E-09	0.0000	1.585E-08	0.0001	6.725E-10	0.0000
Np-237	6.707E-06	0.0564	2.051E-08	0.0002	0.000E+00	0.0000	1.079E-06	0.0091	1.949E-08	0.0002	2.195E-10	0.0000	7.528E-08	0.0006
Pu-238	5.494E-10	0.0000	3.163E-08	0.0003	0.000E+00	0.0000	8.503E-08	0.0007	9.375E-10	0.0000	2.451E-11	0.0000	1.185E-07	0.0010
Pu-239	1.726E-09	0.0000	3.994E-08	0.0003	0.000E+00	0.0000	1.047E-07	0.0009	1.155E-09	0.0000	2.938E-11	0.0000	1.460E-07	0.0012
Pu-241	5.108E-09	0.0000	7.976E-10	0.0000	0.000E+00	0.0000	2.184E-09	0.0000	1.473E-11	0.0000	1.090E-12	0.0000	3.045E-09	0.0000
Se-79	1.514E-11	0.0000	2.282E-12	0.0000	0.000E+00	0.0000	9.249E-08	0.0008	1.327E-07	0.0011	2.826E-08	0.0002	1.286E-09	0.0000
Sn-126	1.174E-05	0.0987	4.734E-11	0.0000	0.000E+00	0.0000	9.361E-09	0.0001	4.893E-09	0.0000	1.206E-09	0.0000	5.205E-09	0.0000
Sr-90	9.652E-08	0.0008	1.832E-10	0.0000	0.000E+00	0.0000	1.003E-05	0.0843	1.086E-06	0.0091	5.749E-07	0.0048	4.664E-08	0.0004
Tc-99	1.117E-10	0.0000	4.369E-12	0.0000	0.000E+00	0.0000	1.909E-06	0.0160	2.557E-09	0.0000	5.363E-08	0.0005	5.309E-10	0.0000
U-233	2.999E-08	0.0003	2.081E-08	0.0002	0.000E+00	0.0000	1.462E-07	0.0012	2.581E-09	0.0000	1.124E-08	0.0001	8.234E-08	0.0007
U-234	2.281E-09	0.0000	2.009E-08	0.0002	0.000E+00	0.0000	1.432E-07	0.0012	2.534E-09	0.0000	1.108E-08	0.0001	7.989E-08	0.0007
U-235	4.669E-06	0.0392	1.812E-08	0.0002	0.000E+00	0.0000	1.472E-07	0.0012	2.666E-09	0.0000	1.133E-08	0.0001	8.184E-08	0.0007
U-238	9.612E-07	0.0081	1.708E-08	0.0001	0.000E+00	0.0000	1.808E-07	0.0015	3.200E-09	0.0000	1.399E-08	0.0001	1.009E-07	0.0008
Total	4.516E-05	0.3795	1.957E-07	0.0016	0.000E+00	0.0000	1.776E-05	0.1493	1.930E-06	0.0162	2.135E-06	0.0179	1.088E-06	0.0091

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 27
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.449E-07	0.0037
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.082E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.066E-06	0.0678
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.366E-05	0.1148
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.928E-09	0.0000	1.926E-10	0.0000	5.710E-10	0.0000	4.692E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.034E-06	0.0423
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.246E-08	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.901E-06	0.0664
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.367E-07	0.0020
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-07	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.115E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.004E-06	0.0252	1.837E-05	0.1544	4.979E-06	0.0418	2.661E-05	0.2236
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-05	0.0995	7.417E-06	0.0623	2.011E-06	0.0169	3.303E-05	0.2776
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-05	0.0994
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.861E-06	0.0240	8.566E-09	0.0001	2.263E-07	0.0019	5.062E-06	0.0425
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.932E-07	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.591E-07	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.930E-06	0.0414
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.277E-06	0.0107
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.771E-05	0.1489	2.580E-05	0.2168	7.218E-06	0.0607	1.190E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 28
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	6.249E-06	1.309E-02	4.260E-05	3.368E-05	7.233E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.040E-02
Am-241	2.727E-02	2.264E+01	1.248E-01	1.270E-02	3.156E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.433E+01
C-14	7.832E-18	1.425E-14	2.134E-15	1.504E-15	3.876E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.789E-14
Co-60	5.370E-04	3.564E+01	1.028E+01	2.208E+00	6.215E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.875E+01
Cs-137	1.388E-02	4.605E+02	2.160E+02	1.258E+02	1.606E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.183E+02
H-3	8.442E-11	2.443E-09	2.139E-10	3.211E-10	4.975E-13	0.000E+00	0.000E+00	3.079E-01	1.692E-02	4.552E-02	3.704E-01
I-129	2.089E-02	3.469E+02	4.393E+01	1.405E+02	2.418E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.555E+02
Ni-63	2.225E-02	9.231E+02	6.991E+01	6.069E+02	2.575E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.626E+03
Np-237	2.734E-02	4.536E+02	8.193E+00	9.178E-02	3.164E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.936E+02
Pa-231	1.761E-05	1.460E-01	1.668E-02	3.899E-05	2.038E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.831E-01
Pb-210	1.217E-08	1.023E-04	1.929E-06	1.651E-06	1.409E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-04
Pu-238	2.200E-02	1.827E+01	2.014E-01	5.125E-03	2.547E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.394E+01
Pu-239	2.786E-02	2.313E+01	2.551E-01	6.490E-03	3.225E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.564E+01
Pu-241	6.580E-03	5.464E+00	6.024E-02	1.533E-03	7.616E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.314E+01
Ra-226	4.862E-08	1.610E-03	2.496E-05	5.472E-05	5.627E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.746E-03
Se-79	1.894E-03	1.577E+02	2.262E+02	4.819E+01	2.192E+00	0.000E+00	0.000E+00	1.333E+04	8.282E+04	2.225E+04	1.188E+05
Sn-126	1.894E-03	3.944E+00	2.061E+00	5.082E-01	2.193E+00	0.000E+00	0.000E+00	1.299E+04	8.262E+03	2.221E+03	2.348E+04
Sr-90	1.350E-02	3.360E+03	3.637E+02	1.926E+02	1.563E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.932E+03
Tc-99	1.895E-03	7.886E+03	1.056E+01	2.215E+02	2.193E+00	0.000E+00	0.000E+00	3.078E+04	9.357E+01	2.451E+03	4.144E+04
Th-229	7.876E-05	6.551E-02	7.255E-04	9.294E-05	9.116E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.575E-01
Th-230	7.518E-06	6.253E-03	6.925E-05	8.871E-06	8.701E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.503E-02
U-233	2.775E-02	5.758E+01	1.019E+00	4.455E+00	3.212E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.517E+01
U-234	2.775E-02	5.758E+01	1.019E+00	4.455E+00	3.212E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.518E+01
U-235	2.775E-02	5.758E+01	1.019E+00	4.455E+00	3.212E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.517E+01
U-238	2.775E-02	5.758E+01	1.019E+00	4.455E+00	3.212E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.517E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 29
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.190E-09	0.0001	6.389E-11	0.0000	4.097E-10	0.0000	1.130E-12	0.0000	1.055E-12	0.0000	2.269E-10	0.0000
Am-241	2.308E-07	0.0038	2.625E-08	0.0004	7.746E-08	0.0013	4.270E-10	0.0000	4.347E-11	0.0000	1.080E-07	0.0018
C-14	0.000E+00	0.0000	8.826E-30	0.0000	1.949E-26	0.0000	2.918E-27	0.0000	2.056E-27	0.0000	4.606E-30	0.0000
Co-60	5.709E-07	0.0094	3.983E-13	0.0000	5.838E-09	0.0001	1.683E-09	0.0000	3.617E-10	0.0000	1.018E-10	0.0000
Cs-137	7.973E-06	0.1316	3.030E-11	0.0000	3.358E-07	0.0055	1.575E-07	0.0026	9.170E-08	0.0015	1.171E-08	0.0002
H-3	0.000E+00	0.0000	6.736E-23	0.0000	3.298E-22	0.0000	2.889E-23	0.0000	4.336E-23	0.0000	6.718E-26	0.0000
I-129	3.607E-08	0.0006	7.682E-11	0.0000	2.567E-06	0.0424	3.251E-07	0.0054	1.040E-06	0.0172	1.789E-07	0.0030
Ni-63	0.000E+00	0.0000	3.030E-12	0.0000	2.072E-08	0.0003	1.569E-09	0.0000	1.362E-08	0.0002	5.779E-10	0.0000
Np-237	6.611E-06	0.1092	2.022E-08	0.0003	1.064E-06	0.0176	1.921E-08	0.0003	2.152E-10	0.0000	7.420E-08	0.0012
Pa-231	1.069E-09	0.0000	4.984E-11	0.0000	1.226E-09	0.0000	1.402E-10	0.0000	3.268E-13	0.0000	1.711E-10	0.0000
Pb-210	4.547E-14	0.0000	2.799E-14	0.0000	2.626E-11	0.0000	4.914E-13	0.0000	4.222E-13	0.0000	3.627E-12	0.0000
Pu-238	4.685E-10	0.0000	2.698E-08	0.0004	7.251E-08	0.0012	7.995E-10	0.0000	2.034E-11	0.0000	1.011E-07	0.0017
Pu-239	1.723E-09	0.0000	3.987E-08	0.0007	1.045E-07	0.0017	1.153E-09	0.0000	2.933E-11	0.0000	1.457E-07	0.0024
Pu-241	1.550E-11	0.0000	8.447E-11	0.0000	1.847E-10	0.0000	2.036E-12	0.0000	5.181E-14	0.0000	2.574E-10	0.0000
Ra-226	2.644E-10	0.0000	7.534E-14	0.0000	4.546E-11	0.0000	7.067E-13	0.0000	1.547E-12	0.0000	1.588E-12	0.0000
Se-79	2.517E-12	0.0000	3.795E-13	0.0000	1.538E-08	0.0003	2.206E-08	0.0004	4.700E-09	0.0001	2.139E-10	0.0000
Sn-126	1.953E-06	0.0322	7.873E-12	0.0000	1.557E-09	0.0000	8.138E-10	0.0000	2.006E-10	0.0000	8.656E-10	0.0000
Sr-90	5.945E-08	0.0010	1.129E-10	0.0000	6.177E-06	0.1020	6.685E-07	0.0110	3.541E-07	0.0058	2.872E-08	0.0005
Tc-99	1.858E-11	0.0000	7.267E-13	0.0000	3.175E-07	0.0052	4.253E-10	0.0000	8.920E-09	0.0001	8.830E-11	0.0000
Th-229	4.014E-08	0.0007	6.729E-10	0.0000	1.743E-09	0.0000	1.928E-11	0.0000	2.465E-12	0.0000	2.427E-09	0.0000
Th-230	2.738E-12	0.0000	9.511E-12	0.0000	2.767E-11	0.0000	3.060E-13	0.0000	3.912E-14	0.0000	3.853E-11	0.0000
U-233	8.421E-09	0.0001	2.036E-08	0.0003	1.447E-07	0.0024	2.560E-09	0.0000	1.119E-08	0.0002	8.069E-08	0.0013
U-234	2.188E-09	0.0000	2.000E-08	0.0003	1.426E-07	0.0024	2.523E-09	0.0000	1.103E-08	0.0002	7.953E-08	0.0013
U-235	4.646E-06	0.0767	1.799E-08	0.0003	1.458E-07	0.0024	2.579E-09	0.0000	1.128E-08	0.0002	8.131E-08	0.0013
U-238	9.570E-07	0.0158	1.700E-08	0.0003	1.801E-07	0.0030	3.186E-09	0.0001	1.393E-08	0.0002	1.004E-07	0.0017
Total	2.310E-05	0.3813	1.898E-07	0.0031	1.138E-05	0.1878	1.210E-06	0.0200	1.561E-06	0.0258	9.953E-07	0.0164

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 30
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.892E-09	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.430E-07	0.0073
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.789E-07	0.0096
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.569E-06	0.1415
H-3	0.000E+00	0.0000	0.000E+00	0.0000	4.192E-14	0.0000	2.303E-15	0.0000	6.197E-15	0.0000	5.042E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.147E-06	0.0685
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-08	0.0006
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.789E-06	0.1286
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.656E-09	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.087E-11	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-07	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-07	0.0048
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.441E-10	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.138E-10	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-06	0.0215	8.071E-06	0.1333	2.168E-06	0.0358	1.158E-05	0.1912
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	5.123E-06	0.0846	3.259E-06	0.0538	8.760E-07	0.0145	1.121E-05	0.1851
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.288E-06	0.1203
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-06	0.0204	3.764E-09	0.0001	9.859E-08	0.0016	1.667E-06	0.0275
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.501E-08	0.0007
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.879E-11	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.679E-07	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.579E-07	0.0043
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.905E-06	0.0810
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-06	0.0210
Total	0.000E+00	0.0000	0.000E+00	0.0000	7.660E-06	0.1265	1.133E-05	0.1871	3.143E-06	0.0519	6.057E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 31
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.243E-07	0.0037	2.550E-08	0.0004	0.000E+00	0.0000	7.526E-08	0.0012	4.151E-10	0.0000	4.222E-11	0.0000	1.049E-07	0.0017
C-14	0.000E+00	0.0000	8.826E-30	0.0000	0.000E+00	0.0000	1.949E-26	0.0000	2.918E-27	0.0000	2.056E-27	0.0000	4.606E-30	0.0000
Co-60	5.709E-07	0.0094	3.983E-13	0.0000	0.000E+00	0.0000	5.838E-09	0.0001	1.683E-09	0.0000	3.617E-10	0.0000	1.018E-10	0.0000
Cs-137	7.973E-06	0.1316	3.030E-11	0.0000	0.000E+00	0.0000	3.358E-07	0.0055	1.575E-07	0.0026	9.170E-08	0.0015	1.171E-08	0.0002
H-3	0.000E+00	0.0000	6.736E-23	0.0000	0.000E+00	0.0000	3.298E-22	0.0000	2.889E-23	0.0000	4.336E-23	0.0000	6.718E-26	0.0000
I-129	3.607E-08	0.0006	7.682E-11	0.0000	0.000E+00	0.0000	2.567E-06	0.0424	3.251E-07	0.0054	1.040E-06	0.0172	1.789E-07	0.0030
Ni-63	0.000E+00	0.0000	3.030E-12	0.0000	0.000E+00	0.0000	2.072E-08	0.0003	1.569E-09	0.0000	1.362E-08	0.0002	5.779E-10	0.0000
Np-237	6.611E-06	0.1092	2.022E-08	0.0003	0.000E+00	0.0000	1.064E-06	0.0176	1.921E-08	0.0003	2.173E-10	0.0000	7.421E-08	0.0012
Pu-238	4.687E-10	0.0000	2.698E-08	0.0004	0.000E+00	0.0000	7.253E-08	0.0012	7.997E-10	0.0000	2.148E-11	0.0000	1.011E-07	0.0017
Pu-239	1.723E-09	0.0000	3.987E-08	0.0007	0.000E+00	0.0000	1.045E-07	0.0017	1.153E-09	0.0000	2.933E-11	0.0000	1.457E-07	0.0024
Pu-241	6.631E-09	0.0001	8.365E-10	0.0000	0.000E+00	0.0000	2.404E-09	0.0000	1.428E-11	0.0000	1.297E-12	0.0000	3.351E-09	0.0001
Se-79	2.517E-12	0.0000	3.795E-13	0.0000	0.000E+00	0.0000	1.538E-08	0.0003	2.206E-08	0.0004	4.700E-09	0.0001	2.139E-10	0.0000
Sn-126	1.953E-06	0.0322	7.873E-12	0.0000	0.000E+00	0.0000	1.557E-09	0.0000	8.138E-10	0.0000	2.006E-10	0.0000	8.656E-10	0.0000
Sr-90	5.945E-08	0.0010	1.129E-10	0.0000	0.000E+00	0.0000	6.177E-06	0.1020	6.685E-07	0.0110	3.541E-07	0.0058	2.872E-08	0.0005
Tc-99	1.858E-11	0.0000	7.267E-13	0.0000	0.000E+00	0.0000	3.175E-07	0.0052	4.253E-10	0.0000	8.920E-09	0.0001	8.830E-11	0.0000
U-233	4.856E-08	0.0008	2.103E-08	0.0003	0.000E+00	0.0000	1.464E-07	0.0024	2.578E-09	0.0000	1.119E-08	0.0002	8.310E-08	0.0014
U-234	2.455E-09	0.0000	2.001E-08	0.0003	0.000E+00	0.0000	1.426E-07	0.0024	2.524E-09	0.0000	1.103E-08	0.0002	7.956E-08	0.0013
U-235	4.653E-06	0.0768	1.810E-08	0.0003	0.000E+00	0.0000	1.474E-07	0.0024	2.720E-09	0.0000	1.128E-08	0.0002	8.171E-08	0.0013
U-238	9.570E-07	0.0158	1.700E-08	0.0003	0.000E+00	0.0000	1.801E-07	0.0030	3.186E-09	0.0001	1.393E-08	0.0002	1.004E-07	0.0017
Total	2.310E-05	0.3813	1.898E-07	0.0031	0.000E+00	0.0000	1.138E-05	0.1878	1.210E-06	0.0200	1.561E-06	0.0258	9.953E-07	0.0164

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 32
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.304E-07	0.0071
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.447E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.789E-07	0.0096
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.569E-06	0.1415
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.192E-14	0.0000	2.303E-15	0.0000	6.197E-15	0.0000	5.042E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.147E-06	0.0685
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.648E-08	0.0006
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.789E-06	0.1286
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.019E-07	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.931E-07	0.0048
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.324E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.299E-06	0.0215	8.071E-06	0.1333	2.168E-06	0.0358	1.158E-05	0.1912
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.123E-06	0.0846	3.259E-06	0.0538	8.760E-07	0.0145	1.121E-05	0.1851
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.288E-06	0.1203
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E-06	0.0204	3.764E-09	0.0001	9.859E-08	0.0016	1.667E-06	0.0275
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.128E-07	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.582E-07	0.0043
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.914E-06	0.0811
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.272E-06	0.0210
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.660E-06	0.1265	1.133E-05	0.1871	3.143E-06	0.0519	6.057E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 33
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.013E-05	8.368E-02	1.824E-04	2.155E-04	4.644E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.305E-01
Am-241	2.447E-02	2.032E+01	1.120E-01	1.140E-02	2.832E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.877E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	5.317E-08	3.529E-03	1.018E-03	2.186E-04	6.153E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.827E-03
Cs-137	2.712E-03	9.000E+01	4.221E+01	2.458E+01	3.139E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.599E+02
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	1.060E-02	1.761E+02	2.230E+01	7.132E+01	1.227E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.820E+02
Ni-63	1.309E-02	5.430E+02	4.112E+01	3.570E+02	1.515E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.562E+02
Np-237	2.600E-02	4.314E+02	7.792E+00	8.728E-02	3.009E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.694E+02
Pa-231	5.777E-05	4.792E-01	5.487E-02	1.275E-04	6.686E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.011E-01
Pb-210	2.946E-07	2.460E-03	4.568E-05	3.941E-05	3.410E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.886E-03
Pu-238	1.261E-02	1.047E+01	1.154E-01	2.937E-03	1.459E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.518E+01
Pu-239	2.770E-02	2.300E+01	2.536E-01	6.453E-03	3.206E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.532E+01
Pu-241	2.256E-04	1.873E-01	2.065E-03	5.254E-05	2.611E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.505E-01
Ra-226	5.301E-07	1.758E-02	2.742E-04	5.994E-04	6.136E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.907E-02
Se-79	3.553E-06	2.958E-01	4.243E-01	9.038E-02	4.112E-03	0.000E+00	0.000E+00	2.481E+01	1.541E+02	4.140E+01	2.211E+02
Sn-126	3.554E-06	7.399E-03	3.868E-03	9.535E-04	4.114E-03	0.000E+00	0.000E+00	2.417E+01	1.538E+01	4.134E+00	4.370E+01
Sr-90	2.475E-03	6.161E+02	6.667E+01	3.531E+01	2.865E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.209E+02
Tc-99	3.556E-06	1.480E+01	1.982E-02	4.157E-01	4.115E-03	0.000E+00	0.000E+00	5.730E+01	1.742E-01	4.562E+00	7.727E+01
Th-229	2.597E-04	2.157E-01	2.382E-03	3.037E-04	3.006E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.190E-01
Th-230	2.486E-05	2.066E-02	2.280E-04	2.907E-05	2.878E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.969E-02
U-233	2.733E-02	5.671E+01	1.003E+00	4.388E+00	3.163E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.374E+01
U-234	2.734E-02	5.672E+01	1.004E+00	4.389E+00	3.164E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.376E+01
U-235	2.733E-02	5.671E+01	1.003E+00	4.388E+00	3.164E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.374E+01
U-238	2.733E-02	5.671E+01	1.003E+00	4.388E+00	3.164E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.374E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 34
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.121E-08	0.0011	2.612E-10	0.0000	1.670E-09	0.0001	3.561E-12	0.0000	4.302E-12	0.0000	9.272E-10	0.0000
Am-241	2.065E-07	0.0103	2.348E-08	0.0012	6.930E-08	0.0034	3.820E-10	0.0000	3.888E-11	0.0000	9.660E-08	0.0048
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.653E-11	0.0000	3.945E-17	0.0000	5.781E-13	0.0000	1.667E-13	0.0000	3.582E-14	0.0000	1.008E-14	0.0000
Cs-137	1.558E-06	0.0773	5.921E-12	0.0000	6.562E-08	0.0033	3.078E-08	0.0015	1.792E-08	0.0009	2.288E-09	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.831E-08	0.0009	3.899E-11	0.0000	1.303E-06	0.0647	1.650E-07	0.0082	5.278E-07	0.0262	9.083E-08	0.0045
Ni-63	0.000E+00	0.0000	1.782E-12	0.0000	1.219E-08	0.0006	9.228E-10	0.0000	8.011E-09	0.0004	3.399E-10	0.0000
Np-237	6.287E-06	0.3121	1.923E-08	0.0010	1.012E-06	0.0502	1.827E-08	0.0009	2.047E-10	0.0000	7.056E-08	0.0035
Pa-231	2.765E-09	0.0001	1.289E-10	0.0000	3.172E-09	0.0002	3.632E-10	0.0000	8.437E-13	0.0000	4.426E-10	0.0000
Pb-210	5.201E-13	0.0000	3.202E-13	0.0000	2.991E-10	0.0000	5.551E-12	0.0000	4.792E-12	0.0000	4.149E-11	0.0000
Pu-238	2.685E-10	0.0000	1.546E-08	0.0008	4.155E-08	0.0021	4.581E-10	0.0000	1.166E-11	0.0000	5.792E-08	0.0029
Pu-239	1.713E-09	0.0001	3.964E-08	0.0020	1.039E-07	0.0052	1.146E-09	0.0001	2.916E-11	0.0000	1.449E-07	0.0072
Pu-241	5.312E-13	0.0000	2.895E-12	0.0000	6.330E-12	0.0000	6.979E-14	0.0000	1.776E-15	0.0000	8.824E-12	0.0000
Ra-226	1.747E-09	0.0001	4.979E-13	0.0000	3.007E-10	0.0000	4.690E-12	0.0000	1.025E-11	0.0000	1.049E-11	0.0000
Se-79	4.721E-15	0.0000	7.117E-16	0.0000	2.885E-11	0.0000	4.139E-11	0.0000	8.817E-12	0.0000	4.011E-13	0.0000
Sn-126	3.664E-09	0.0002	1.477E-14	0.0000	2.921E-12	0.0000	1.527E-12	0.0000	3.764E-13	0.0000	1.624E-12	0.0000
Sr-90	1.090E-08	0.0005	2.069E-11	0.0000	1.132E-06	0.0562	1.226E-07	0.0061	6.491E-08	0.0032	5.266E-09	0.0003
Tc-99	3.486E-14	0.0000	1.364E-15	0.0000	5.959E-10	0.0000	7.981E-13	0.0000	1.674E-11	0.0000	1.657E-13	0.0000
Th-229	1.044E-07	0.0052	1.749E-09	0.0001	4.529E-09	0.0002	4.999E-11	0.0000	6.372E-12	0.0000	6.310E-09	0.0003
Th-230	7.140E-12	0.0000	2.480E-11	0.0000	7.210E-11	0.0000	7.959E-13	0.0000	1.014E-13	0.0000	1.005E-10	0.0000
U-233	8.295E-09	0.0004	2.005E-08	0.0010	1.425E-07	0.0071	2.521E-09	0.0001	1.102E-08	0.0005	7.948E-08	0.0039
U-234	2.156E-09	0.0001	1.971E-08	0.0010	1.405E-07	0.0070	2.485E-09	0.0001	1.087E-08	0.0005	7.835E-08	0.0039
U-235	4.577E-06	0.2272	1.772E-08	0.0009	1.436E-07	0.0071	2.540E-09	0.0001	1.111E-08	0.0006	8.008E-08	0.0040
U-238	9.426E-07	0.0468	1.675E-08	0.0008	1.773E-07	0.0088	3.138E-09	0.0002	1.372E-08	0.0007	9.892E-08	0.0049
Total	1.375E-05	0.6823	1.743E-07	0.0087	4.354E-06	0.2161	3.507E-07	0.0174	6.657E-07	0.0330	8.134E-07	0.0404

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 35
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.408E-08	0.0012
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.963E-07	0.0197
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.732E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.675E-06	0.0831
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.105E-06	0.1045
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-08	0.0011
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.407E-06	0.3677
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.873E-09	0.0003
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.518E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.157E-07	0.0057
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.914E-07	0.0145
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.865E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.074E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-09	0.0001	1.502E-08	0.0007	4.035E-09	0.0002	2.155E-08	0.0011
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	9.535E-09	0.0005	6.065E-09	0.0003	1.630E-09	0.0001	2.090E-08	0.0010
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-06	0.0663
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	2.305E-09	0.0001	7.008E-12	0.0000	1.835E-10	0.0000	3.109E-09	0.0002
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.170E-07	0.0058
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.054E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.638E-07	0.0131
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-07	0.0126
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.832E-06	0.2398
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.252E-06	0.0622
Total	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-08	0.0007	2.109E-08	0.0010	5.849E-09	0.0003	2.015E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 36
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.999E-07	0.0099	2.270E-08	0.0011	0.000E+00	0.0000	6.703E-08	0.0033	3.700E-10	0.0000	3.760E-11	0.0000	9.340E-08	0.0046
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	5.653E-11	0.0000	3.945E-17	0.0000	0.000E+00	0.0000	5.781E-13	0.0000	1.667E-13	0.0000	3.582E-14	0.0000	1.008E-14	0.0000
Cs-137	1.558E-06	0.0773	5.921E-12	0.0000	0.000E+00	0.0000	6.562E-08	0.0033	3.078E-08	0.0015	1.792E-08	0.0009	2.288E-09	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.831E-08	0.0009	3.899E-11	0.0000	0.000E+00	0.0000	1.303E-06	0.0647	1.650E-07	0.0082	5.278E-07	0.0262	9.083E-08	0.0045
Ni-63	0.000E+00	0.0000	1.782E-12	0.0000	0.000E+00	0.0000	1.219E-08	0.0006	9.228E-10	0.0000	8.011E-09	0.0004	3.399E-10	0.0000
Np-237	6.287E-06	0.3121	1.924E-08	0.0010	0.000E+00	0.0000	1.012E-06	0.0502	1.827E-08	0.0009	2.100E-10	0.0000	7.060E-08	0.0035
Pu-238	2.691E-10	0.0000	1.546E-08	0.0008	0.000E+00	0.0000	4.158E-08	0.0021	4.587E-10	0.0000	1.398E-11	0.0000	5.794E-08	0.0029
Pu-239	1.713E-09	0.0001	3.964E-08	0.0020	0.000E+00	0.0000	1.039E-07	0.0052	1.146E-09	0.0001	2.916E-11	0.0000	1.449E-07	0.0072
Pu-241	6.850E-09	0.0003	7.810E-10	0.0000	0.000E+00	0.0000	2.304E-09	0.0001	1.275E-11	0.0000	1.290E-12	0.0000	3.210E-09	0.0002
Se-79	4.721E-15	0.0000	7.117E-16	0.0000	0.000E+00	0.0000	2.885E-11	0.0000	4.139E-11	0.0000	8.817E-12	0.0000	4.011E-13	0.0000
Sn-126	3.664E-09	0.0002	1.477E-14	0.0000	0.000E+00	0.0000	2.921E-12	0.0000	1.527E-12	0.0000	3.764E-13	0.0000	1.624E-12	0.0000
Sr-90	1.090E-08	0.0005	2.069E-11	0.0000	0.000E+00	0.0000	1.132E-06	0.0562	1.226E-07	0.0061	6.491E-08	0.0032	5.266E-09	0.0003
Tc-99	3.486E-14	0.0000	1.364E-15	0.0000	0.000E+00	0.0000	5.959E-10	0.0000	7.981E-13	0.0000	1.674E-11	0.0000	1.657E-13	0.0000
U-233	1.126E-07	0.0056	2.179E-08	0.0011	0.000E+00	0.0000	1.469E-07	0.0073	2.570E-09	0.0001	1.102E-08	0.0005	8.575E-08	0.0043
U-234	3.909E-09	0.0002	1.972E-08	0.0010	0.000E+00	0.0000	1.410E-07	0.0070	2.495E-09	0.0001	1.088E-08	0.0005	7.846E-08	0.0039
U-235	4.601E-06	0.2284	1.811E-08	0.0009	0.000E+00	0.0000	1.484E-07	0.0074	2.907E-09	0.0001	1.111E-08	0.0006	8.145E-08	0.0040
U-238	9.426E-07	0.0468	1.675E-08	0.0008	0.000E+00	0.0000	1.774E-07	0.0088	3.139E-09	0.0002	1.373E-08	0.0007	9.895E-08	0.0049
Total	1.375E-05	0.6823	1.743E-07	0.0087	0.000E+00	0.0000	4.354E-06	0.2161	3.507E-07	0.0174	6.657E-07	0.0330	8.134E-07	0.0404

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 37
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.834E-07	0.0190
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.732E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.675E-06	0.0831
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.105E-06	0.1045
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-08	0.0011
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.407E-06	0.3677
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.157E-07	0.0057
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.914E-07	0.0145
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.316E-08	0.0007
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-09	0.0001	1.502E-08	0.0007	4.035E-09	0.0002	2.155E-08	0.0011
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.535E-09	0.0005	6.065E-09	0.0003	1.630E-09	0.0001	2.090E-08	0.0010
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.336E-06	0.0663
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.305E-09	0.0001	7.008E-12	0.0000	1.835E-10	0.0000	3.109E-09	0.0002
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.807E-07	0.0189
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.565E-07	0.0127
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.863E-06	0.2414
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.253E-06	0.0622
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-08	0.0007	2.109E-08	0.0010	5.849E-09	0.0003	2.015E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 38
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.470E-04	3.062E-01	5.920E-04	7.888E-04	1.701E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.777E-01
Am-241	1.757E-02	1.459E+01	8.042E-02	8.186E-03	2.034E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.501E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	1.926E-19	1.279E-14	3.687E-15	7.921E-16	2.229E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.749E-14
Cs-137	2.556E-05	8.483E-01	3.978E-01	2.317E-01	2.958E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.507E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	1.528E-03	2.537E+01	3.213E+00	1.028E+01	1.768E+00	0.000E+00	0.000E+00	1.109E+03	4.862E+02	1.879E+03	3.514E+03
Ni-63	2.873E-03	1.192E+02	9.028E+00	7.838E+01	3.326E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.099E+02
Np-237	2.252E-02	3.737E+02	6.749E+00	7.560E-02	2.606E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.066E+02
Pa-231	1.656E-04	1.374E+00	1.574E-01	3.651E-04	1.917E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.724E+00
Pb-210	3.671E-06	3.059E-02	5.658E-04	4.893E-04	4.249E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.589E-02
Pu-238	2.569E-03	2.133E+00	2.352E-02	5.984E-04	2.973E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.130E+00
Pu-239	2.724E-02	2.262E+01	2.494E-01	6.346E-03	3.153E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.441E+01
Pu-241	1.471E-08	1.221E-05	1.346E-07	3.426E-09	1.702E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.937E-05
Ra-226	4.522E-06	1.501E-01	2.344E-03	5.120E-03	5.234E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.628E-01
Se-79	5.749E-14	4.785E-09	6.865E-09	1.462E-09	6.654E-11	0.000E+00	0.000E+00	3.919E-07	2.434E-06	6.539E-07	3.493E-06
Sn-126	5.755E-14	1.198E-10	6.262E-11	1.544E-11	6.661E-11	0.000E+00	0.000E+00	3.821E-07	2.430E-07	6.534E-08	6.907E-07
Sr-90	1.943E-05	4.837E+00	5.235E-01	2.772E-01	2.249E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.660E+00
Tc-99	5.762E-14	2.398E-07	3.211E-10	6.736E-09	6.668E-11	0.000E+00	0.000E+00	9.063E-07	2.755E-09	7.216E-08	1.228E-06
Th-229	7.552E-04	6.272E-01	6.918E-03	8.808E-04	8.741E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.509E+00
Th-230	7.295E-05	6.058E-02	6.682E-04	8.507E-05	8.443E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.458E-01
U-233	2.617E-02	5.430E+01	9.608E-01	4.202E+00	3.029E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.976E+01
U-234	2.618E-02	5.433E+01	9.612E-01	4.203E+00	3.030E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.979E+01
U-235	2.617E-02	5.431E+01	9.609E-01	4.202E+00	3.029E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.976E+01
U-238	2.617E-02	5.431E+01	9.609E-01	4.202E+00	3.029E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.976E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

RPP-RPT-58329, Rev. 3

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 39
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.907E-08	0.0017	8.503E-10	0.0000	5.433E-09	0.0001	1.048E-11	0.0000	1.400E-11	0.0000	3.019E-09	0.0001
Am-241	1.482E-07	0.0037	1.686E-08	0.0004	4.975E-08	0.0013	2.742E-10	0.0000	2.791E-11	0.0000	6.935E-08	0.0017
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.048E-22	0.0000	1.401E-28	0.0000	2.094E-24	0.0000	6.038E-25	0.0000	1.297E-25	0.0000	3.651E-26	0.0000
Cs-137	1.469E-08	0.0004	5.581E-14	0.0000	6.185E-10	0.0000	2.901E-10	0.0000	1.689E-10	0.0000	2.157E-11	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.639E-09	0.0001	5.619E-12	0.0000	1.878E-07	0.0047	2.378E-08	0.0006	7.607E-08	0.0019	1.309E-08	0.0003
Ni-63	0.000E+00	0.0000	3.913E-13	0.0000	2.675E-09	0.0001	2.026E-10	0.0000	1.759E-09	0.0000	7.464E-11	0.0000
Np-237	5.446E-06	0.1369	1.666E-08	0.0004	8.763E-07	0.0220	1.583E-08	0.0004	1.773E-10	0.0000	6.112E-08	0.0015
Pa-231	7.319E-09	0.0002	3.413E-10	0.0000	8.399E-09	0.0002	9.621E-10	0.0000	2.231E-12	0.0000	1.172E-09	0.0000
Pb-210	5.221E-12	0.0000	3.214E-12	0.0000	2.998E-09	0.0001	5.545E-11	0.0000	4.795E-11	0.0000	4.165E-10	0.0000
Pu-238	5.470E-11	0.0000	3.150E-09	0.0001	8.467E-09	0.0002	9.335E-11	0.0000	2.375E-12	0.0000	1.180E-08	0.0003
Pu-239	1.685E-09	0.0000	3.899E-08	0.0010	1.022E-07	0.0026	1.127E-09	0.0000	2.868E-11	0.0000	1.425E-07	0.0036
Pu-241	3.464E-17	0.0000	1.888E-16	0.0000	4.128E-16	0.0000	4.551E-18	0.0000	1.158E-19	0.0000	5.754E-16	0.0000
Ra-226	1.266E-08	0.0003	3.608E-12	0.0000	2.180E-09	0.0001	3.404E-11	0.0000	7.437E-11	0.0000	7.603E-11	0.0000
Se-79	7.639E-23	0.0000	1.152E-23	0.0000	4.668E-19	0.0000	6.696E-19	0.0000	1.426E-19	0.0000	6.490E-21	0.0000
Sn-126	5.932E-17	0.0000	2.392E-22	0.0000	4.730E-20	0.0000	2.472E-20	0.0000	6.095E-21	0.0000	2.630E-20	0.0000
Sr-90	8.557E-11	0.0000	1.624E-13	0.0000	8.891E-09	0.0002	9.623E-10	0.0000	5.096E-10	0.0000	4.134E-11	0.0000
Tc-99	5.649E-22	0.0000	2.210E-23	0.0000	9.656E-18	0.0000	1.293E-20	0.0000	2.712E-19	0.0000	2.685E-21	0.0000
Th-229	2.802E-07	0.0070	4.698E-09	0.0001	1.216E-08	0.0003	1.341E-10	0.0000	1.707E-11	0.0000	1.694E-08	0.0004
Th-230	1.934E-11	0.0000	6.718E-11	0.0000	1.953E-10	0.0000	2.154E-12	0.0000	2.742E-13	0.0000	2.721E-10	0.0000
U-233	7.942E-09	0.0002	1.920E-08	0.0005	1.364E-07	0.0034	2.414E-09	0.0001	1.056E-08	0.0003	7.610E-08	0.0019
U-234	2.065E-09	0.0001	1.887E-08	0.0005	1.345E-07	0.0034	2.380E-09	0.0001	1.041E-08	0.0003	7.503E-08	0.0019
U-235	4.382E-06	0.1102	1.697E-08	0.0004	1.375E-07	0.0035	2.433E-09	0.0001	1.064E-08	0.0003	7.669E-08	0.0019
U-238	9.027E-07	0.0227	1.604E-08	0.0004	1.698E-07	0.0043	3.005E-09	0.0001	1.314E-08	0.0003	9.473E-08	0.0024
Total	1.128E-05	0.2835	1.527E-07	0.0038	1.846E-06	0.0464	5.399E-08	0.0014	1.236E-07	0.0031	6.424E-07	0.0162

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 40
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.839E-08	0.0020
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.845E-07	0.0072
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.579E-08	0.0004
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	8.197E-06	0.2061	3.595E-06	0.0904	1.389E-05	0.3491	2.598E-05	0.6532
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.712E-09	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.416E-06	0.1613
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.820E-08	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.526E-09	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.357E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.866E-07	0.0072
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.216E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.503E-08	0.0004
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	3.818E-17	0.0000	2.372E-16	0.0000	6.372E-17	0.0000	3.404E-16	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	1.507E-16	0.0000	9.585E-17	0.0000	2.577E-17	0.0000	3.317E-16	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.049E-08	0.0003
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	3.645E-17	0.0000	1.108E-19	0.0000	2.903E-18	0.0000	4.941E-17	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.142E-07	0.0079
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.564E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.526E-07	0.0064
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.433E-07	0.0061
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.627E-06	0.1163
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.199E-06	0.0302
Total	0.000E+00	0.0000	0.000E+00	0.0000	8.197E-06	0.2061	3.595E-06	0.0904	1.389E-05	0.3491	3.978E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 41
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.438E-07	0.0036	1.630E-08	0.0004	0.000E+00	0.0000	4.817E-08	0.0012	2.665E-10	0.0000	2.700E-11	0.0000	6.704E-08	0.0017
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	2.048E-22	0.0000	1.401E-28	0.0000	0.000E+00	0.0000	2.094E-24	0.0000	6.038E-25	0.0000	1.297E-25	0.0000	3.651E-26	0.0000
Cs-137	1.469E-08	0.0004	5.581E-14	0.0000	0.000E+00	0.0000	6.185E-10	0.0000	2.901E-10	0.0000	1.689E-10	0.0000	2.157E-11	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.639E-09	0.0001	5.619E-12	0.0000	0.000E+00	0.0000	1.878E-07	0.0047	2.378E-08	0.0006	7.607E-08	0.0019	1.309E-08	0.0003
Ni-63	0.000E+00	0.0000	3.913E-13	0.0000	0.000E+00	0.0000	2.675E-09	0.0001	2.026E-10	0.0000	1.759E-09	0.0000	7.464E-11	0.0000
Np-237	5.445E-06	0.1369	1.668E-08	0.0004	0.000E+00	0.0000	8.764E-07	0.0220	1.583E-08	0.0004	1.907E-10	0.0000	6.122E-08	0.0015
Pu-238	5.765E-11	0.0000	3.156E-09	0.0001	0.000E+00	0.0000	8.512E-09	0.0002	9.416E-11	0.0000	5.868E-12	0.0000	1.183E-08	0.0003
Pu-239	1.686E-09	0.0000	3.899E-08	0.0010	0.000E+00	0.0000	1.022E-07	0.0026	1.127E-09	0.0000	2.868E-11	0.0000	1.425E-07	0.0036
Pu-241	4.954E-09	0.0001	5.617E-10	0.0000	0.000E+00	0.0000	1.660E-09	0.0000	9.181E-12	0.0000	9.305E-13	0.0000	2.311E-09	0.0001
Se-79	7.639E-23	0.0000	1.152E-23	0.0000	0.000E+00	0.0000	4.668E-19	0.0000	6.696E-19	0.0000	1.426E-19	0.0000	6.490E-21	0.0000
Sn-126	5.932E-17	0.0000	2.392E-22	0.0000	0.000E+00	0.0000	4.730E-20	0.0000	2.472E-20	0.0000	6.095E-21	0.0000	2.630E-20	0.0000
Sr-90	8.557E-11	0.0000	1.624E-13	0.0000	0.000E+00	0.0000	8.891E-09	0.0002	9.623E-10	0.0000	5.096E-10	0.0000	4.134E-11	0.0000
Tc-99	5.649E-22	0.0000	2.210E-23	0.0000	0.000E+00	0.0000	9.656E-18	0.0000	1.293E-20	0.0000	2.712E-19	0.0000	2.685E-21	0.0000
U-233	2.880E-07	0.0072	2.387E-08	0.0006	0.000E+00	0.0000	1.484E-07	0.0037	2.545E-09	0.0001	1.056E-08	0.0003	9.294E-08	0.0023
U-234	1.474E-08	0.0004	1.892E-08	0.0005	0.000E+00	0.0000	1.397E-07	0.0035	2.469E-09	0.0001	1.052E-08	0.0003	7.571E-08	0.0019
U-235	4.459E-06	0.1121	1.816E-08	0.0005	0.000E+00	0.0000	1.513E-07	0.0038	3.405E-09	0.0001	1.065E-08	0.0003	8.088E-08	0.0020
U-238	9.027E-07	0.0227	1.605E-08	0.0004	0.000E+00	0.0000	1.699E-07	0.0043	3.007E-09	0.0001	1.315E-08	0.0003	9.480E-08	0.0024
Total	1.128E-05	0.2835	1.527E-07	0.0038	0.000E+00	0.0000	1.846E-06	0.0464	5.399E-08	0.0014	1.236E-07	0.0031	6.424E-07	0.0162

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 42
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.756E-07	0.0069
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.579E-08	0.0004
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.197E-06	0.2061	3.595E-06	0.0904	1.389E-05	0.3491	2.598E-05	0.6532
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.712E-09	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.416E-06	0.1613
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.365E-08	0.0006
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.866E-07	0.0072
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.497E-09	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.818E-17	0.0000	2.372E-16	0.0000	6.372E-17	0.0000	3.404E-16	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.507E-16	0.0000	9.585E-17	0.0000	2.577E-17	0.0000	3.317E-16	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.049E-08	0.0003
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.645E-17	0.0000	1.108E-19	0.0000	2.903E-18	0.0000	4.941E-17	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.663E-07	0.0142
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-07	0.0066
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.723E-06	0.1187
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.200E-06	0.0302
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.197E-06	0.2061	3.595E-06	0.0904	1.389E-05	0.3491	3.978E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 43
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.518E-04	9.408E-01	1.757E-03	2.424E-03	5.229E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.468E+00
Am-241	5.505E-03	4.571E+00	2.520E-02	2.565E-03	6.371E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.097E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	2.078E-12	6.897E-08	3.235E-08	1.884E-08	2.405E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.226E-07
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	1.736E-06	2.883E-02	3.650E-03	1.168E-02	2.009E-03	0.000E+00	0.000E+00	1.169E+00	5.126E-01	1.980E+00	3.708E+00
Ni-63	1.425E-05	5.912E-01	4.477E-02	3.887E-01	1.649E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.041E+00
Np-237	1.362E-02	2.260E+02	4.082E+00	4.573E-02	1.576E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.459E+02
Pa-231	4.709E-04	3.907E+00	4.476E-01	1.038E-03	5.450E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.901E+00
Pb-210	3.940E-05	3.281E-01	6.062E-03	5.245E-03	4.560E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.850E-01
Pu-238	9.808E-06	8.144E-03	8.979E-05	2.285E-06	1.135E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.959E-02
Pu-239	2.571E-02	2.134E+01	2.353E-01	5.988E-03	2.975E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.134E+01
Pu-241	3.294E-23	2.735E-20	3.015E-22	7.672E-24	3.812E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.578E-20
Ra-226	4.183E-05	1.388E+00	2.169E-02	4.738E-02	4.841E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.506E+00
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	8.333E-13	2.074E-07	2.245E-08	1.189E-08	9.645E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.427E-07
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	2.258E-03	1.875E+00	2.068E-02	2.631E-03	2.614E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.512E+00
Th-230	2.251E-04	1.869E-01	2.061E-03	2.622E-04	2.605E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.497E-01
U-233	2.247E-02	4.662E+01	8.249E-01	3.607E+00	2.601E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.706E+01
U-234	2.250E-02	4.668E+01	8.260E-01	3.612E+00	2.604E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.716E+01
U-235	2.249E-02	4.667E+01	8.257E-01	3.611E+00	2.603E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.713E+01
U-238	2.249E-02	4.667E+01	8.257E-01	3.611E+00	2.603E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.713E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 44
Intrisk : Residual Dose and Risk Assessment for Residential Receptor
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\RESIDENTIAL RECEPTOR.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.052E-07	0.0185	2.526E-09	0.0002	1.614E-08	0.0015	3.013E-11	0.0000	4.158E-11	0.0000	8.970E-09	0.0008
Am-241	4.644E-08	0.0042	5.281E-09	0.0005	1.559E-08	0.0014	8.592E-11	0.0000	8.745E-12	0.0000	2.173E-08	0.0020
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.194E-15	0.0000	4.538E-21	0.0000	5.029E-17	0.0000	2.358E-17	0.0000	1.373E-17	0.0000	1.754E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.998E-12	0.0000	6.384E-15	0.0000	2.133E-10	0.0000	2.702E-11	0.0000	8.641E-11	0.0000	1.487E-11	0.0000
Ni-63	0.000E+00	0.0000	1.940E-15	0.0000	1.327E-11	0.0000	1.005E-12	0.0000	8.723E-12	0.0000	3.701E-13	0.0000
Np-237	3.294E-06	0.2977	1.007E-08	0.0009	5.300E-07	0.0479	9.573E-09	0.0009	1.072E-10	0.0000	3.697E-08	0.0033
Pa-231	2.021E-08	0.0018	9.422E-10	0.0001	2.319E-08	0.0021	2.657E-09	0.0002	6.158E-12	0.0000	3.234E-09	0.0003
Pb-210	5.239E-11	0.0000	3.225E-11	0.0000	3.007E-08	0.0027	5.554E-10	0.0001	4.806E-10	0.0000	4.179E-09	0.0004
Pu-238	2.089E-13	0.0000	1.203E-11	0.0000	3.233E-11	0.0000	3.564E-13	0.0000	9.069E-15	0.0000	4.506E-11	0.0000
Pu-239	1.590E-09	0.0001	3.679E-08	0.0033	9.645E-08	0.0087	1.063E-09	0.0001	2.706E-11	0.0000	1.344E-07	0.0122
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	1.103E-07	0.0100	3.145E-11	0.0000	1.900E-08	0.0017	2.970E-10	0.0000	6.486E-10	0.0001	6.627E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	3.669E-18	0.0000	6.966E-21	0.0000	3.813E-16	0.0000	4.127E-17	0.0000	2.185E-17	0.0000	1.773E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	8.136E-07	0.0735	1.364E-08	0.0012	3.529E-08	0.0032	3.892E-10	0.0000	4.952E-11	0.0000	4.919E-08	0.0044
Th-230	5.794E-11	0.0000	2.013E-10	0.0000	5.849E-10	0.0001	6.449E-12	0.0000	8.207E-13	0.0000	8.153E-10	0.0001
U-233	6.819E-09	0.0006	1.649E-08	0.0015	1.171E-07	0.0106	2.072E-09	0.0002	9.062E-09	0.0008	6.534E-08	0.0059
U-234	1.774E-09	0.0002	1.622E-08	0.0015	1.156E-07	0.0104	2.045E-09	0.0002	8.943E-09	0.0008	6.448E-08	0.0058
U-235	3.766E-06	0.3404	1.458E-08	0.0013	1.181E-07	0.0107	2.090E-09	0.0002	9.140E-09	0.0008	6.590E-08	0.0060
U-238	7.756E-07	0.0701	1.378E-08	0.0012	1.459E-07	0.0132	2.582E-09	0.0002	1.129E-08	0.0010	8.140E-08	0.0074
Total	9.041E-06	0.8173	1.306E-07	0.0118	1.263E-06	0.1142	2.348E-08	0.0021	3.990E-08	0.0036	5.374E-07	0.0486

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 45
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-07	0.0211
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.913E-08	0.0081
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	8.637E-09	0.0008	3.788E-09	0.0003	1.463E-08	0.0013	2.740E-08	0.0025
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.881E-06	0.3508
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.023E-08	0.0045
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.537E-08	0.0032
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.999E-11	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.704E-07	0.0244
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.310E-07	0.0118
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.499E-16	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.122E-07	0.0825
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.667E-09	0.0002
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.169E-07	0.0196
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.090E-07	0.0189
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.976E-06	0.3594
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-06	0.0932
Total	0.000E+00	0.0000	0.000E+00	0.0000	8.637E-09	0.0008	3.788E-09	0.0003	1.463E-08	0.0013	1.106E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 46
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	4.559E-08	0.0041	5.107E-09	0.0005	0.000E+00	0.0000	1.518E-08	0.0014	8.508E-11	0.0000	8.480E-12	0.0000	2.101E-08	0.0019
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	1.194E-15	0.0000	4.538E-21	0.0000	0.000E+00	0.0000	5.029E-17	0.0000	2.358E-17	0.0000	1.373E-17	0.0000	1.754E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	2.998E-12	0.0000	6.384E-15	0.0000	0.000E+00	0.0000	2.133E-10	0.0000	2.702E-11	0.0000	8.641E-11	0.0000	1.487E-11	0.0000
Ni-63	0.000E+00	0.0000	1.940E-15	0.0000	0.000E+00	0.0000	1.327E-11	0.0000	1.005E-12	0.0000	8.723E-12	0.0000	3.701E-13	0.0000
Np-237	3.295E-06	0.2978	1.015E-08	0.0009	0.000E+00	0.0000	5.304E-07	0.0479	9.579E-09	0.0009	1.387E-10	0.0000	3.728E-08	0.0034
Pu-238	3.241E-11	0.0000	1.803E-11	0.0000	0.000E+00	0.0000	8.867E-11	0.0000	1.348E-12	0.0000	3.597E-12	0.0000	7.024E-11	0.0000
Pu-239	1.594E-09	0.0001	3.679E-08	0.0033	0.000E+00	0.0000	9.645E-08	0.0087	1.063E-09	0.0001	2.707E-11	0.0000	1.344E-07	0.0122
Pu-241	1.571E-09	0.0001	1.760E-10	0.0000	0.000E+00	0.0000	5.230E-10	0.0000	2.930E-12	0.0000	2.922E-13	0.0000	7.241E-10	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	3.669E-18	0.0000	6.966E-21	0.0000	0.000E+00	0.0000	3.813E-16	0.0000	4.127E-17	0.0000	2.185E-17	0.0000	1.773E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	8.189E-07	0.0740	3.004E-08	0.0027	0.000E+00	0.0000	1.519E-07	0.0137	2.454E-09	0.0002	9.080E-09	0.0008	1.142E-07	0.0103
U-234	1.121E-07	0.0101	1.643E-08	0.0015	0.000E+00	0.0000	1.648E-07	0.0149	2.896E-09	0.0003	1.004E-08	0.0009	6.992E-08	0.0063
U-235	3.991E-06	0.3608	1.805E-08	0.0016	0.000E+00	0.0000	1.575E-07	0.0142	4.777E-09	0.0004	9.188E-09	0.0008	7.810E-08	0.0071
U-238	7.757E-07	0.0701	1.383E-08	0.0012	0.000E+00	0.0000	1.463E-07	0.0132	2.589E-09	0.0002	1.132E-08	0.0010	8.159E-08	0.0074
Total	9.041E-06	0.8173	1.306E-07	0.0118	0.000E+00	0.0000	1.263E-06	0.1142	2.348E-08	0.0021	3.990E-08	0.0036	5.374E-07	0.0486

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/29/2014 17:59 Page 47
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.698E-08	0.0079
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.283E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.637E-09	0.0008	3.788E-09	0.0003	1.463E-08	0.0013	2.740E-08	0.0025
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-11	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.882E-06	0.3509
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.143E-10	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.704E-07	0.0244
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.997E-09	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.499E-16	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.127E-06	0.1018
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.762E-07	0.0340
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.259E-06	0.3850
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-06	0.0932
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.637E-09	0.0008	3.788E-09	0.0003	1.463E-08	0.0013	1.106E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-7: Results of Radiological Risk Assessment for CTUIR Residential Receptor

Table D-7-1: Results of Radiological Risk Assessment For EA A Plus B at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0.18	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	2.E-07	5.E-12	7.E-08	7.E-10	3.E-11	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07
C-14	3.4	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	1.E-11	6.E-10	9.E-07	3.E-07	9.E-08	7.E-10	0.E+00	0.E+00	0.E+00	1.E-06
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	2.E-03	1.E-12	6.E-05	5.E-05	1.E-05	5.E-06	0.E+00	0.E+00	0.E+00	2.E-03
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	3.E-09	1.E-11	2.E-07	3.E-09	4.E-11	5.E-07	0.E+00	0.E+00	0.E+00	7.E-07
Pu-241	1.2	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	3.E-08	1.E-12	1.E-08	2.E-10	6.E-12	5.E-08	0.E+00	0.E+00	0.E+00	9.E-08
Se-79	2.4	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	2.E-10	6.E-15	1.E-06	3.E-06	3.E-07	4.E-08	3.E-05	2.E-04	2.E-05	2.E-04
Sn-126	31.7	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	2.E-03	2.E-12	1.E-06	1.E-06	2.E-07	2.E-06	1.E-03	1.E-03	1.E-04	4.E-03
Sr-90	17.1	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	7.E-06	3.E-12	7.E-04	1.E-04	3.E-05	8.E-06	0.E+00	0.E+00	0.E+00	9.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-09	6.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.0089	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.19	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**3.E-03**	**6.E-10**	**8.E-04**	**2.E-04**	**5.E-05**	**2.E-05**	**1.E-03**	**1.E-03**	**2.E-04**	**7.2.E-03**

Table D-7-2: Results of Radiological Risk Assessment For EA A Plus B at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0.18	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	4.E-08	1.E-12	1.E-08	1.E-10	6.E-12	4.E-08	0.E+00	0.E+00	0.E+00	1.E-07
C-14	3.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	1.E-13	9.E-23	5.E-15	4.E-15	1.E-15	4.E-16	0.E+00	0.E+00	0.E+00	1.E-13
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	3.E-09	1.E-11	1.E-07	3.E-09	4.E-11	5.E-07	0.E+00	0.E+00	0.E+00	7.E-07
Pu-241	1.2	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	1.E-08	2.E-13	3.E-09	3.E-11	1.E-12	1.E-08	0.E+00	0.E+00	0.E+00	2.E-08
Se-79	2.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	2.E-16	8.E-23	2.E-14	4.E-15	1.E-15	2.E-16	0.E+00	0.E+00	0.E+00	3.E-14
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	5.E-12	2.E-07	7.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	6.E-07
U-235	0.0089	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	7.E-09	4.E-10	3.E-10	8.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.19	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	8.E-07	3.E-12	1.E-07	4.E-09	9.E-09	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-06**	**2.E-11**	**5.E-07**	**1.E-08**	**2.E-08**	**1.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**3.E-06**

Table D-7-3: Results of Radiological Risk Assessment For EA C at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All	Water Independent Pathways						Water Dependant Pathway			All
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathway	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.09	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	4.E-04	3.E-13	2.E-05	1.E-05	4.E-06	1.E-06	0.E+00	0.E+00	0.E+00	4.E-04
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	2.E-14	5.E-07	7.E-08	3.E-07	3.E-08	0.E+00	0.E+00	0.E+00	9.E-07
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	3.E-03	3.E-12	3.E-06	2.E-06	3.E-07	3.E-06	2.E-03	2.E-03	2.E-04	7.E-03
Sr-90	3	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	1.E-06	5.E-13	1.E-04	2.E-05	6.E-06	1.E-06	0.E+00	0.E+00	0.E+00	2.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	3.E-07	3.E-13	1.E-08	3.E-10	6.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.28	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	5.E-12	3.E-07	8.E-09	2.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**4.E-03**	**9.E-12**	**1.E-04**	**4.E-05**	**1.E-05**	**7.E-06**	**2.E-03**	**2.E-03**	**2.E-04**	**8.0.E-03**

Table D-7-4: Results of Radiological Risk Assessment For EA C at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All	Water Independent Pathways						Water Dependant Pathways			All
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathway	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	3.E-14	2.E-23	1.E-15	1.E-15	3.E-16	1.E-16	0.E+00	0.E+00	0.E+00	3.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	8.E-18	3.E-10	3.E-11	1.E-10	2.E-11	0.E+00	0.E+00	0.E+00	5.E-10
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	4.E-17	1.E-23	4.E-15	7.E-16	2.E-16	4.E-17	0.E+00	0.E+00	0.E+00	5.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	3.E-07	3.E-13	1.E-08	6.E-10	5.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.28	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**1.E-06**	**4.E-12**	**2.E-07**	**7.E-09**	**1.E-08**	**3.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-06**

Table D-7-5: Results of Radiological Risk Assessment For EA E at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All Pathways	Water Independent Pathways						Vater Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	3.E-04	2.E-13	1.E-05	9.E-06	3.E-06	1.E-06	0.E+00	0.E+00	0.E+00	3.E-04
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	3.E-10	1.E-14	2.E-06	4.E-06	5.E-07	6.E-08	4.E-05	3.E-04	4.E-05	4.E-04
Sn-126	18.5	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	1.E-03	1.E-12	9.E-07	8.E-07	1.E-07	1.E-06	8.E-04	6.E-04	8.E-05	3.E-03
Sr-90	2.5	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	1.E-06	4.E-13	1.E-04	2.E-05	5.E-06	1.E-06	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	4.E-07	5.E-11	1.E-06	5.E-08	1.E-07	2.E-06	0.E+00	0.E+00	0.E+00	4.E-06
U-234	0.45	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	6.E-09	1.E-11	3.E-07	1.E-08	2.E-08	4.E-07	0.E+00	0.E+00	0.E+00	8.E-07
U-235	0.0012	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	3.E-08	2.E-14	9.E-10	3.E-11	6.E-11	1.E-09	0.E+00	0.E+00	0.E+00	3.E-08
U-238	0.28	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	5.E-12	3.E-07	8.E-09	2.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
				Excess Cancer Risk								**1.E-03**	**6.E-11**	**1.E-04**	**3.E-05**	**8.E-06**	**6.E-06**	**8.E-04**	**9.E-04**	**1.E-04**	**3.E-03**

Table D-7-6: Results of Radiological Risk Assessment For EA E at T =1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All Pathways	Water Independent Pathways						Vater Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	2.E-14	2.E-23	8.E-16	7.E-16	2.E-16	7.E-17	0.E+00	0.E+00	0.E+00	2.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	3.E-17	1.E-23	3.E-15	6.E-16	2.E-16	3.E-17	0.E+00	0.E+00	0.E+00	4.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	9.E-06	7.E-11	2.E-06	4.E-08	8.E-08	3.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.45	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	3.E-07	8.E-12	4.E-07	1.E-08	2.E-08	4.E-07	0.E+00	0.E+00	0.E+00	1.E-06
U-235	0.0012	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-08	2.E-14	9.E-10	5.E-11	5.E-11	1.E-09	0.E+00	0.E+00	0.E+00	3.E-08
U-238	0.28	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**1.E-05**	**8.E-11**	**2.E-06**	**6.E-08**	**1.E-07**	**3.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-05**

Table D-7-7: Results of Radiological Risk Assessment For EA F Plus G at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	4.E-11	2.E-09	3.E-06	1.E-06	3.E-07	3.E-09	0.E+00	0.E+00	0.E+00	5.E-06
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	2.E-04	1.E-13	7.E-06	6.E-06	2.E-06	6.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	2.E-10	6.E-15	1.E-06	3.E-06	3.E-07	4.E-08	3.E-05	2.E-04	2.E-05	2.E-04
Sn-126	2.6	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	2.E-04	1.E-13	1.E-07	1.E-07	1.E-08	2.E-07	1.E-04	8.E-05	1.E-05	4.E-04
Sr-90	0.3	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	1.E-07	5.E-14	1.E-05	2.E-06	6.E-07	1.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-07	3.E-11	1.E-06	3.E-08	7.E-08	2.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.3	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	4.E-09	7.E-12	2.E-07	7.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.01	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	5.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.24	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	7.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**3.E-04**	**2.E-09**	**3.E-05**	**1.E-05**	**3.E-06**	**3.E-06**	**1.E-04**	**3.E-04**	**3.E-05**	**8.2.E-04**

Table D-7-8: Results of Radiological Risk Assessment For EA F Plus G at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g))										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathway			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	1.E-14	1.E-23	5.E-16	4.E-16	1.E-16	4.E-17	0.E+00	0.E+00	0.E+00	1.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	4.E-18	1.E-24	4.E-16	7.E-17	2.E-17	4.E-18	0.E+00	0.E+00	0.E+00	5.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	7.E-06	5.E-11	1.E-06	3.E-08	6.E-08	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.3	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	5.E-12	2.E-07	8.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	7.E-07
U-235	0.01	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	8.E-09	4.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.24	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**8.E-06**	**6.E-11**	**2.E-06**	**5.E-08**	**8.E-08**	**3.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-7-9: Results of Radiological Risk Assessment For EA H Plus I at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	1.E-11	6.E-10	9.E-07	3.E-07	9.E-08	7.E-10	0.E+00	0.E+00	0.E+00	1.E-06
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	7.E-07	3.E-06	5.E-07	3.E-07	2.E-09	6.E-07	5.E-08	7.E-08	5.E-06
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	2.E-10	7.E-15	1.E-06	3.E-06	3.E-07	4.E-08	3.E-05	2.E-04	3.E-05	3.E-04
Sn-126	7.7	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	5.E-04	4.E-13	4.E-07	3.E-07	4.E-08	5.E-07	3.E-04	2.E-04	3.E-05	1.E-03
Sr-90	0	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-07	4.E-11	1.E-06	4.E-08	8.E-08	2.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.35	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	4.E-09	8.E-12	3.E-07	8.E-09	2.E-08	3.E-07	0.E+00	0.E+00	0.E+00	6.E-07
U-235	0.0078	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	6.E-09	2.E-10	4.E-10	8.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.18	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	9.E-07	3.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
				Excess Cancer Risk								**5.E-04**	**7.E-07**	**7.E-06**	**4.E-06**	**9.E-07**	**3.E-06**	**4.E-04**	**4.E-04**	**6.E-05**	**1.E-03**

Table D-7-10: Results of Radiological Risk Assessment For EA H Plus I at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g))										Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	7.E-06	5.E-11	1.E-06	3.E-08	6.E-08	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.35	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	6.E-12	3.E-07	9.E-09	2.E-08	3.E-07	0.E+00	0.E+00	0.E+00	8.E-07
U-235	0.0078	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	6.E-09	3.E-10	3.E-10	7.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.18	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	7.E-07	3.E-12	1.E-07	4.E-09	9.E-09	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
				Excess Cancer Risk								**8.E-06**	**6.E-11**	**2.E-06**	**5.E-08**	**9.E-08**	**3.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-7-11: Results of Radiological Risk Assessment For EA J at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All Pathways	Water Independent Pathways						Vater Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	5.E-11	2.E-09	4.E-06	1.E-06	4.E-07	3.E-09	0.E+00	0.E+00	0.E+00	5.E-06
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	3.E-04	3.E-13	1.E-05	1.E-05	3.E-06	1.E-06	0.E+00	0.E+00	0.E+00	3.E-04
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	2.E-10	2.E-12	3.E-08	5.E-10	7.E-12	9.E-08	0.E+00	0.E+00	0.E+00	1.E-07
Pu-239	0.038	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	3.E-10	2.E-12	2.E-08	4.E-10	5.E-12	7.E-08	0.E+00	0.E+00	0.E+00	9.E-08
Pu-241	0.14	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	4.E-09	1.E-13	2.E-09	2.E-11	7.E-13	5.E-09	0.E+00	0.E+00	0.E+00	1.E-08
Se-79	11.3	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	9.E-10	3.E-14	5.E-06	1.E-05	1.E-06	2.E-07	1.E-04	9.E-04	1.E-04	1.E-03
Sn-126	0	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	2.E-06	7.E-13	2.E-04	3.E-05	8.E-06	2.E-06	0.E+00	0.E+00	0.E+00	2.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	5.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.22	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**3.E-04**	**2.E-09**	**2.E-04**	**6.E-05**	**1.E-05**	**4.E-06**	**1.E-04**	**9.E-04**	**1.E-04**	**2.E-03**

Table D-7-12: Results of Radiological Risk Assessment For EA J at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	2.E-14	2.E-23	9.E-16	8.E-16	2.E-16	8.E-17	0.E+00	0.E+00	0.E+00	3.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	1.E-11	1.E-15	3.E-11	8.E-13	1.E-12	5.E-11	0.E+00	0.E+00	0.E+00	9.E-11
Pu-239	0.038	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	3.E-10	2.E-12	2.E-08	4.E-10	4.E-12	6.E-08	0.E+00	0.E+00	0.E+00	8.E-08
Pu-241	0.14	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	1.E-09	3.E-14	4.E-10	3.E-12	2.E-13	1.E-09	0.E+00	0.E+00	0.E+00	3.E-09
Se-79	11.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	5.E-17	2.E-23	5.E-15	9.E-16	2.E-16	6.E-17	0.E+00	0.E+00	0.E+00	6.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	8.E-09	4.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-06**	**5.E-12**	**2.E-07**	**6.E-09**	**1.E-08**	**3.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-06**

Table D-7-13: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	2.E-10	9.E-09	1.E-05	4.E-06	1.E-06	1.E-08	0.E+00	0.E+00	0.E+00	2.E-05
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	2.E-04	2.E-13	8.E-06	6.E-06	2.E-06	7.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	4.7	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	4.E-08	2.E-07	3.E-08	2.E-08	9.E-11	4.E-08	3.E-09	4.E-09	3.E-07
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	1.E-12	4.E-05	6.E-06	2.E-05	3.E-06	0.E+00	0.E+00	0.E+00	8.E-05
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	1.E-10	4.E-15	7.E-07	2.E-06	2.E-07	3.E-08	2.E-05	1.E-04	2.E-05	2.E-04
Sn-126	8.9	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	6.E-04	5.E-13	4.E-07	4.E-07	5.E-08	6.E-07	4.E-04	3.E-04	4.E-05	1.E-03
Sr-90	2	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	8.E-07	3.E-13	8.E-05	2.E-05	4.E-06	9.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-07	3.E-11	1.E-06	3.E-08	7.E-08	2.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.25	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-09	6.E-12	2.E-07	6.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	5.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.23	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**7.E-04**	**5.E-08**	**2.E-04**	**3.E-05**	**3.E-05**	**7.E-06**	**4.E-04**	**4.E-04**	**5.E-05**	**2.E-03**

Table D-7-14: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 1000 Year

Nuclide	EPC pCi/g	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	1.E-14	1.E-23	6.E-16	5.E-16	1.E-16	5.E-17	0.E+00	0.E+00	0.E+00	2.E-14
H-3	4.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	7.E-16	2.E-08	3.E-09	1.E-08	2.E-09	0.E+00	0.E+00	0.E+00	4.E-08
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	2.E-17	1.E-23	2.E-15	5.E-16	1.E-16	3.E-17	0.E+00	0.E+00	0.E+00	3.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	7.E-06	5.E-11	1.E-06	3.E-08	6.E-08	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.25	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	4.E-12	2.E-07	6.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	6.E-07
U-235	0.01	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	8.E-09	4.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.23	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
				Excess Cancer Risk								**8.E-06**	**6.E-11**	**2.E-06**	**5.E-08**	**9.E-08**	**3.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-7-15: Results of Radiological Risk Assessment For EA P at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	3.E-06	6.E-11	8.E-07	8.E-09	4.E-10	3.E-06	0.E+00	0.E+00	0.E+00	6.E-06
C-14	0	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	5.E-05	7.E-15	5.E-07	2.E-07	3.E-08	2.E-08	0.E+00	0.E+00	0.E+00	5.E-05
Cs-137	32.1	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	2.E-03	1.E-12	7.E-05	6.E-05	2.E-05	6.E-06	0.E+00	0.E+00	0.E+00	2.E-03
H-3	308	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	3.E-06	1.E-05	2.E-06	1.E-06	6.E-09	2.E-06	2.E-07	3.E-07	2.E-05
I-129	0.81	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	2.E-07	8.E-14	1.E-05	3.E-06	4.E-06	2.E-06	0.E+00	0.E+00	0.E+00	2.E-05
Ni-63	85	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	3.E-13	9.E-06	1.E-06	5.E-06	6.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Np-237	1.5	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	5.E-05	3.E-11	8.E-06	3.E-07	1.E-09	1.E-06	0.E+00	0.E+00	0.E+00	6.E-05
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	1.E-07	5.E-10	6.E-06	1.E-07	1.E-09	2.E-05	0.E+00	0.E+00	0.E+00	2.E-05
Pu-241	39.9	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	1.E-06	4.E-11	4.E-07	5.E-09	2.E-10	2.E-06	0.E+00	0.E+00	0.E+00	3.E-06
Se-79	4.6	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	4.E-10	1.E-14	2.E-06	5.E-06	6.E-07	7.E-08	5.E-05	4.E-04	5.E-05	5.E-04
Sn-126	0	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	3.E-05	1.E-11	3.E-03	7.E-04	2.E-04	4.E-05	0.E+00	0.E+00	0.E+00	4.E-03
Tc-99	24	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	1.E-08	1.E-13	2.E-04	5.E-07	6.E-06	2.E-07	2.E-04	9.E-07	1.E-05	5.E-04
U-233	1.9	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	4.E-07	4.E-11	1.E-06	4.E-08	9.E-08	2.E-06	0.E+00	0.E+00	0.E+00	4.E-06
U-234	0.72	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	9.E-09	2.E-11	5.E-07	2.E-08	3.E-08	7.E-07	0.E+00	0.E+00	0.E+00	1.E-06
U-235	0.025	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	6.E-07	5.E-13	2.E-08	6.E-10	1.E-09	2.E-08	0.E+00	0.E+00	0.E+00	7.E-07
U-238	0.52	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	3.E-06	1.E-11	5.E-07	1.E-08	3.E-08	6.E-07	0.E+00	0.E+00	0.E+00	4.E-06
											Excess Cancer Risk	**2.E-03**	**3.E-06**	**4.E-03**	**7.E-04**	**2.E-04**	**8.E-05**	**3.E-04**	**4.E-04**	**6.E-05**	**7.E-03**

Table D-7-16: Results of Radiological Risk Assessment For EA P at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	5.E-07	1.E-11	2.E-07	2.E-09	8.E-11	5.E-07	0.E+00	0.E+00	0.E+00	1.E-06
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	1.E-13	1.E-22	5.E-15	4.E-15	1.E-15	5.E-16	0.E+00	0.E+00	0.E+00	1.E-13
H-3	308	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	1.E-11	5.E-18	7.E-10	2.E-10	2.E-10	1.E-10	4.E-08	2.E-08	4.E-08	1.E-07
Ni-63	85	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	2.E-16	5.E-09	6.E-10	3.E-09	3.E-10	0.E+00	0.E+00	0.E+00	9.E-09
Np-237	1.5	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	3.E-05	2.E-11	4.E-06	1.E-07	9.E-10	7.E-07	0.E+00	0.E+00	0.E+00	3.E-05
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	9.E-08	4.E-10	5.E-06	1.E-07	1.E-09	2.E-05	0.E+00	0.E+00	0.E+00	2.E-05
Pu-241	39.9	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	3.E-07	7.E-12	1.E-07	1.E-09	5.E-11	3.E-07	0.E+00	0.E+00	0.E+00	8.E-07
Se-79	4.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	1.E-15	4.E-22	1.E-13	2.E-14	5.E-15	1.E-15	0.E+00	0.E+00	0.E+00	1.E-13
Tc-99	24	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	8.E-06	6.E-11	1.E-06	4.E-08	7.E-08	3.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.72	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	4.E-07	1.E-11	6.E-07	2.E-08	3.E-08	6.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-235	0.025	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	5.E-07	5.E-13	2.E-08	1.E-09	1.E-09	2.E-08	0.E+00	0.E+00	0.E+00	6.E-07
U-238	0.52	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	2.E-06	8.E-12	4.E-07	1.E-08	3.E-08	5.E-07	0.E+00	0.E+00	0.E+00	3.E-06
											Excess Cancer Risk	**4.E-05**	**6.E-10**	**1.E-05**	**3.E-07**	**1.E-07**	**2.E-05**	**4.E-08**	**2.E-08**	**4.E-08**	**7.E-05**

Table D-7-17: Results of Radiological Risk Assessment For EA R at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						/ater Dependant Pathwa			All Pathway s	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	2.E-08	1.E-07	2.E-08	1.E-08	5.E-11	2.E-08	2.E-09	2.E-09	2.E-07
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	2.E-07	6.E-14	2.E-05	3.E-06	8.E-07	2.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	5.E-07	6.E-11	2.E-06	5.E-08	1.E-07	2.E-06	0.E+00	0.E+00	0.E+00	5.E-06
U-234	0.22	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	3.E-09	5.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	5.E-10	1.E-08	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.22	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
				Excess Cancer Risk								**2.E-06**	**2.E-08**	**2.E-05**	**3.E-06**	**9.E-07**	**3.E-06**	**2.E-08**	**2.E-09**	**2.E-09**	**3.E-05**

Table D-7-18: Results of Radiological Risk Assessment For EA R at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						/ater Dependant Pathwa			All Pathway s	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	5.E-18	2.E-24	5.E-16	9.E-17	2.E-17	5.E-18	0.E+00	0.E+00	0.E+00	6.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-05	8.E-11	2.E-06	5.E-08	9.E-08	3.E-06	0.E+00	0.E+00	0.E+00	2.E-05
U-234	0.22	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	1.E-07	4.E-12	2.E-07	6.E-09	9.E-09	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.01	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	8.E-09	4.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
				Excess Cancer Risk								**1.E-05**	**9.E-11**	**2.E-06**	**6.E-08**	**1.E-07**	**4.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-05**

Table D-7-19: Results of Radiological Risk Assessment For EA U at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	3E-11	4E-07	4E-09	2E-10	1E-06	0E+00	0E+00	0E+00	3E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	4E-12	2E-10	3E-07	8E-08	3E-08	2E-10	0E+00	0E+00	0E+00	4E-07	6.E-12	3.E-10	4.E-07	1.E-07	5.E-08	3.E-10	0.E+00	0.E+00	0.E+00	6.E-07
Co-60	0	6E-05	9E-15	6E-07	3E-07	3E-08	2E-08	0E+00	0E+00	0E+00	6E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	6E-05	4E-14	2E-06	2E-06	5E-07	2E-07	0E+00	0E+00	0E+00	6E-05	1.E-04	9.E-14	5.E-06	4.E-06	1.E-06	4.E-07	0.E+00	0.E+00	0.E+00	1.E-04
H-3	0	0E+00	9E-09	4E-08	6E-09	4E-09	2E-11	8E-09	6E-10	9E-10	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	9E-14	1E-05	3E-06	5E-06	2E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	4E-15	1E-07	1E-08	6E-08	8E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	3E-05	2E-11	5E-06	2E-07	9E-10	9E-07	0E+00	0E+00	0E+00	4E-05	2.E-05	1.E-11	3.E-06	1.E-07	6.E-10	5.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Pu-238	0	3E-09	3E-11	4E-07	8E-09	1E-10	1E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	9E-09	4E-11	5E-07	1E-08	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	9E-13	1E-08	1E-10	5E-12	4E-08	0E+00	0E+00	0E+00	8E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	8E-11	3E-15	5E-07	1E-06	1E-07	2E-08	1E-05	8E-05	1E-05	1E-04	2.E-10	7.E-15	1.E-06	3.E-06	3.E-07	4.E-08	3.E-05	2.E-04	3.E-05	3.E-04
Sn-126	6.3	6E-05	5E-14	5E-08	4E-08	5E-09	6E-08	4E-05	3E-05	4E-06	1E-04	4.E-04	3.E-13	3.E-07	3.E-07	3.E-08	4.E-07	3.E-04	2.E-04	3.E-05	9.E-04
Sr-90	4.2	4E-07	2E-13	4E-05	8E-06	2E-06	5E-07	0E+00	0E+00	0E+00	5E-05	2.E-06	7.E-13	2.E-04	3.E-05	9.E-06	2.E-06	0.E+00	0.E+00	0.E+00	2.E-04
Tc-99	0	6E-10	5E-15	1E-05	2E-08	2E-07	6E-09	8E-06	4E-08	5E-07	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	2E-07	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	5.E-07	5.E-11	2.E-06	5.E-08	1.E-07	2.E-06	0.E+00	0.E+00	0.E+00	4.E-06
U-234	0.31	1E-08	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	2E-06	4.E-09	7.E-12	2.E-07	7.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.0089	2E-05	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	3E-05	2.E-07	2.E-13	7.E-09	2.E-10	4.E-10	9.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.21	5E-06	2E-11	9E-07	3E-08	6E-08	1E-06	0E+00	0E+00	0E+00	7E-06	1.E-06	4.E-12	2.E-07	6.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**5.E-04**	**4.E-10**	**2.E-04**	**4.E-05**	**1.E-05**	**6.E-06**	**3.E-04**	**4.E-04**	**5.E-05**	**2.E-03**

Table D-7-20: Results of Radiological Risk Assessment For EA U at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g))										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	5E-12	7E-08	7E-10	4E-11	2E-07	0E+00	0E+00	0E+00	6E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	4E-15	3E-24	2E-16	1E-16	4E-17	1E-17	0E+00	0E+00	0E+00	4E-15	9.E-15	7.E-24	3.E-16	3.E-16	8.E-17	3.E-17	0.E+00	0.E+00	0.E+00	9.E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	6E-18	9E-10	2E-10	3E-10	1E-10	5E-08	3E-08	5E-08	1E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-18	6E-11	8E-12	3E-11	4E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	2E-05	1E-11	3E-06	8E-08	6E-10	4E-07	0E+00	0E+00	0E+00	2E-05	1.E-05	7.E-12	2.E-06	5.E-08	4.E-10	3.E-07	0.E+00	0.E+00	0.E+00	1.E-05
Pu-238	0	2E-10	2E-14	4E-10	1E-11	2E-11	8E-10	0E+00	0E+00	0E+00	1E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	8E-09	4E-11	5E-07	9E-09	1E-10	2E-06	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	8E-09	2E-13	3E-09	2E-11	1E-12	8E-09	0E+00	0E+00	0E+00	2E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	1E-17	5E-24	1E-15	2E-16	6E-17	1E-17	0E+00	0E+00	0E+00	2E-15	5.E-17	2.E-23	5.E-15	1.E-15	3.E-16	6.E-17	0.E+00	0.E+00	0.E+00	7.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	4E-06	3E-11	8E-07	2E-08	4E-08	1E-06	0E+00	0E+00	0E+00	7E-06	9.E-06	7.E-11	2.E-06	5.E-08	8.E-08	3.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.31	6E-07	2E-11	8E-07	3E-08	4E-08	8E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	6.E-12	3.E-07	8.E-09	1.E-08	3.E-07	0.E+00	0.E+00	0.E+00	7.E-07
U-235	0.0089	2E-05	2E-11	8E-07	4E-08	4E-08	9E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	7.E-09	4.E-10	3.E-10	8.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.21	4E-06	2E-11	7E-07	2E-08	5E-08	1E-06	0E+00	0E+00	0E+00	6E-06	8.E-07	3.E-12	2.E-07	5.E-09	1.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**2.E-05**	**9.E-11**	**4.E-06**	**1.E-07**	**1.E-07**	**4.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**3.E-05**

Table D-7-21: Maximum Risk Assessment Results for CTUIR Resident Receptor

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Radiological COPCs										
External Gamma	3.E-03	4.E-03	1.E-03	3.E-04	5.E-04	3.E-04	7.E-04	2.E-03	2.E-06	5.E-04
Inhalation	6.E-10	9.E-12	6.E-11	2.E-09	7.E-07	2.E-09	5.E-08	3.E-06	2.E-08	4.E-10
Fruits, Vegetables and Grains Ingestion	2.E-03	2.E-03	9.E-04	2.E-04	4.E-04	3.E-04	5.E-04	4.E-03	2.E-05	5.E-04
Meat Ingestion	1.E-03	2.E-03	9.E-04	3.E-04	4.E-04	3.E-07	4.E-04	1.E-03	3.E-06	4.E-04
Milk Ingestion	1.E-03	2.E-04	1.E-04	4.E-05	6.E-05	1.E-04	8.E-05	3.E-04	9.E-07	6.E-05
Soil Ingestion	2.E-05	7.E-06	6.E-06	3.E-06	3.E-06	4.E-06	7.E-06	8.E-05	3.E-06	6.E-06
Cumulative ELCR	**7E-03**	**8E-03**	**3E-03**	**8E-04**	**1E-03**	**2E-03**	**2E-03**	**7E-03**	**3E-05**	**2E-03**

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR CTUIR RESIDENTIAL RECEPTOR

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   1
 Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
```

Table of Contents

Part III: Intake Quantities and Health Risk Factors


```
 Cancer Risk Slope Factors ...............................    2
 Risk Slope and ETFG for the Ground Pathway ..............    6
 Amount of Intake Quantities and Excess Cancer Risks
      Time= 0.000E+00 ....................................    8
      Time= 1.000E+00 ....................................   13
      Time= 3.000E+00 ....................................   18
      Time= 1.000E+01 ....................................   23
      Time= 2.163E+01 ....................................   28
      Time= 3.000E+01 ....................................   33
      Time= 1.000E+02 ....................................   38
      Time= 3.000E+02 ....................................   43
      Time= 1.000E+03 ....................................   48
```

```
RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   2
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   3
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

0 Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   4
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
```

Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   5
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                      Current     Base      Parameter
  Menu                          Parameter                              Value      Case*       Name
-----------------------------------------------------------------------------------------------------------
Sf-Rn  Bi-214                                                        1.50E-11   1.50E-11   SLPFRN(1,4)

Sf-Rn  Radon K factors, (mrem/WLM):
Sf-Rn  Rn-222 Indoor                                                 7.60E+02   7.60E+02   KFACTR(1,1)
Sf-Rn  Rn-222 Outdoor                                                5.70E+02   5.70E+02   KFACTR(1,2)
------Ï-------------------------------------------------------------Ï-----------Ï-----------Ï--------------
*Base Case means Default.Lib w/o Associate Nuclide contributions.
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RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 6
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.163E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	6.482E-01	6.482E-01	6.482E-01	6.482E-01	6.482E-01	6.482E-01	6.482E-01	6.482E-01	6.482E-01
Ac-227	3.480E-10	6.496E-01	6.496E-01	6.496E-01	6.496E-01	6.496E-01	6.496E-01	6.496E-01	6.496E-01	6.496E-01
Am-241	2.760E-08	6.524E-01	6.524E-01	6.524E-01	6.524E-01	6.524E-01	6.524E-01	6.524E-01	6.524E-01	6.524E-01
At-217	1.320E-09	6.325E-01	6.325E-01	6.325E-01	6.325E-01	6.325E-01	6.325E-01	6.325E-01	6.325E-01	6.325E-01
At-218	3.570E-09	6.521E-01	6.521E-01	6.521E-01	6.521E-01	6.521E-01	6.521E-01	6.521E-01	6.521E-01	6.521E-01
Ba-137m	2.690E-06	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01
Bi-210	2.760E-09	6.380E-01	6.380E-01	6.380E-01	6.380E-01	6.380E-01	6.380E-01	6.380E-01	6.380E-01	6.380E-01
Bi-211	1.880E-07	6.382E-01	6.382E-01	6.382E-01	6.382E-01	6.382E-01	6.382E-01	6.382E-01	6.382E-01	6.382E-01
Bi-213	5.650E-07	6.330E-01	6.330E-01	6.330E-01	6.330E-01	6.330E-01	6.330E-01	6.330E-01	6.330E-01	6.330E-01
Bi-214	7.480E-06	6.344E-01	6.344E-01	6.344E-01	6.344E-01	6.344E-01	6.344E-01	6.344E-01	6.344E-01	6.344E-01
C-14	7.830E-12	6.571E-01	6.571E-01	6.571E-01	6.571E-01	6.571E-01	6.571E-01	6.571E-01	6.571E-01	6.571E-01
Co-60	1.240E-05	6.340E-01	6.340E-01	6.340E-01	6.340E-01	6.340E-01	6.340E-01	6.340E-01	6.340E-01	6.340E-01
Cs-137	5.320E-10	6.443E-01	6.443E-01	6.443E-01	6.443E-01	6.443E-01	6.443E-01	6.443E-01	6.443E-01	6.443E-01
Fr-221	1.110E-07	6.441E-01	6.441E-01	6.441E-01	6.441E-01	6.441E-01	6.441E-01	6.441E-01	6.441E-01	6.441E-01
Fr-223	1.400E-07	6.419E-01	6.419E-01	6.419E-01	6.419E-01	6.419E-01	6.419E-01	6.419E-01	6.419E-01	6.419E-01
H-3	0.000E+00	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01
I-129	6.100E-09	6.690E-01	6.690E-01	6.690E-01	6.690E-01	6.690E-01	6.690E-01	6.690E-01	6.690E-01	6.690E-01
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	6.502E-01	6.502E-01	6.502E-01	6.502E-01	6.502E-01	6.502E-01	6.502E-01	6.502E-01	6.502E-01
Pa-231	1.390E-07	6.385E-01	6.385E-01	6.385E-01	6.385E-01	6.385E-01	6.385E-01	6.385E-01	6.385E-01	6.385E-01
Pa-233	7.430E-07	6.394E-01	6.394E-01	6.394E-01	6.394E-01	6.394E-01	6.394E-01	6.394E-01	6.394E-01	6.394E-01
Pa-234	8.710E-06	6.338E-01	6.338E-01	6.338E-01	6.338E-01	6.338E-01	6.338E-01	6.338E-01	6.338E-01	6.338E-01
Pa-234m	6.870E-08	6.331E-01	6.331E-01	6.331E-01	6.331E-01	6.331E-01	6.331E-01	6.331E-01	6.331E-01	6.331E-01
Pb-209	5.370E-10	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01
Pb-210	1.410E-09	6.579E-01	6.579E-01	6.579E-01	6.579E-01	6.579E-01	6.579E-01	6.579E-01	6.579E-01	6.579E-01
Pb-211	2.290E-07	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01
Pb-214	9.820E-07	6.381E-01	6.381E-01	6.381E-01	6.381E-01	6.381E-01	6.381E-01	6.381E-01	6.381E-01	6.381E-01
Po-210	3.950E-11	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01
Po-211	3.580E-08	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01
Po-215	7.480E-10	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01
Po-218	4.260E-11	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01	6.329E-01
Pu-238	7.220E-11	6.820E-01	6.820E-01	6.820E-01	6.820E-01	6.820E-01	6.820E-01	6.820E-01	6.820E-01	6.820E-01
Pu-239	2.000E-10	6.466E-01	6.466E-01	6.466E-01	6.466E-01	6.466E-01	6.466E-01	6.466E-01	6.466E-01	6.466E-01
Pu-241	4.110E-12	6.501E-01	6.501E-01	6.501E-01	6.501E-01	6.501E-01	6.501E-01	6.501E-01	6.501E-01	6.501E-01
Ra-223	4.340E-07	6.418E-01	6.418E-01	6.418E-01	6.418E-01	6.418E-01	6.418E-01	6.418E-01	6.418E-01	6.418E-01
Ra-225	5.910E-09	6.569E-01	6.569E-01	6.569E-01	6.569E-01	6.569E-01	6.569E-01	6.569E-01	6.569E-01	6.569E-01
Ra-226	2.290E-08	6.465E-01	6.465E-01	6.465E-01	6.465E-01	6.465E-01	6.465E-01	6.465E-01	6.465E-01	6.465E-01
Rn-219	2.250E-07	6.388E-01	6.388E-01	6.388E-01	6.388E-01	6.388E-01	6.388E-01	6.388E-01	6.388E-01	6.388E-01
Rn-222	1.740E-09	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01
Sb-126	1.280E-05	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01	6.289E-01
Sb-126m	6.940E-06	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01	6.296E-01

Se-79	1.100E-11	6.517E-01	6.517E-01	6.517E-01	6.517E-01	6.517E-01	6.517E-01	6.517E-01	6.517E-01	6.517E-01
Sn-126	9.960E-08	6.509E-01	6.509E-01	6.509E-01	6.509E-01	6.509E-01	6.509E-01	6.509E-01	6.509E-01	6.509E-01
Sr-90	4.820E-10	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01	6.464E-01
Tc-99	8.140E-11	6.499E-01	6.499E-01	6.499E-01	6.499E-01	6.499E-01	6.499E-01	6.499E-01	6.499E-01	6.499E-01
Th-227	3.780E-07	6.444E-01	6.444E-01	6.444E-01	6.444E-01	6.444E-01	6.444E-01	6.444E-01	6.444E-01	6.444E-01
Th-229	2.250E-07	6.486E-01	6.486E-01	6.486E-01	6.486E-01	6.486E-01	6.486E-01	6.486E-01	6.486E-01	6.486E-01
Th-230	8.190E-10	6.491E-01	6.491E-01	6.491E-01	6.491E-01	6.491E-01	6.491E-01	6.491E-01	6.491E-01	6.491E-01

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   7
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	2.163E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	6.508E-01	6.508E-01	6.508E-01	6.508E-01	6.508E-01	6.508E-01	6.508E-01	6.508E-01	6.508E-01
Th-234	1.630E-08	6.505E-01	6.505E-01	6.505E-01	6.505E-01	6.505E-01	6.505E-01	6.505E-01	6.505E-01	6.505E-01
Tl-207	1.520E-08	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01
Tl-209	9.830E-06	6.365E-01	6.365E-01	6.365E-01	6.365E-01	6.365E-01	6.365E-01	6.365E-01	6.365E-01	6.365E-01
Tl-210	0.000E+00	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01
U-233	9.820E-10	6.473E-01	6.473E-01	6.473E-01	6.473E-01	6.473E-01	6.473E-01	6.473E-01	6.473E-01	6.473E-01
U-234	2.520E-10	6.555E-01	6.555E-01	6.555E-01	6.555E-01	6.555E-01	6.555E-01	6.555E-01	6.555E-01	6.555E-01
U-235	5.180E-07	6.463E-01	6.463E-01	6.463E-01	6.463E-01	6.463E-01	6.463E-01	6.463E-01	6.463E-01	6.463E-01
U-237	3.760E-07	6.467E-01	6.467E-01	6.467E-01	6.467E-01	6.467E-01	6.467E-01	6.467E-01	6.467E-01	6.467E-01
U-238	4.990E-11	6.797E-01	6.797E-01	6.797E-01	6.797E-01	6.797E-01	6.797E-01	6.797E-01	6.797E-01	6.797E-01
Y-90	1.910E-08	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01	6.328E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 8
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	1.141E-05	4.310E+01	4.191E-01	2.076E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.895E+02
C-14	1.360E+02	1.815E+05	4.500E+04	1.666E+04	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.433E+05
Co-60	1.141E-05	3.444E+03	1.752E+03	1.833E+02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.526E+03
Cs-137	1.141E-05	1.722E+03	1.425E+03	4.039E+02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.697E+03
H-3	1.143E+04	2.842E+05	3.807E+04	2.932E+04	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.517E+05
I-129	1.141E-05	8.615E+02	1.923E+02	2.995E+02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.499E+03
Ni-63	1.141E-05	2.153E+03	2.876E+02	1.216E+03	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.802E+03
Np-237	1.141E-05	8.610E+02	2.744E+01	1.496E-01	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.035E+03
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	1.141E-05	4.310E+01	8.381E-01	1.038E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.899E+02
Pu-239	1.141E-05	4.310E+01	8.381E-01	1.038E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.899E+02
Pu-241	1.141E-05	4.310E+01	8.381E-01	1.038E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.899E+02
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	1.141E-05	4.305E+03	1.077E+04	1.122E+03	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.634E+04
Sn-126	1.141E-05	1.077E+02	9.886E+01	1.192E+01	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.645E+02
Sr-90	1.141E-05	1.292E+04	2.466E+03	6.358E+02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.616E+04
Tc-99	1.141E-05	2.153E+05	5.022E+02	5.152E+03	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.211E+05
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	1.141E-05	1.077E+02	3.361E+00	7.155E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.642E+02
U-234	1.141E-05	1.077E+02	3.361E+00	7.155E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.642E+02
U-235	1.141E-05	1.077E+02	3.361E+00	7.155E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.642E+02
U-238	1.141E-05	1.077E+02	3.361E+00	7.155E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.642E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page   9
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.214E-08	0.0000	5.723E-14	0.0000	1.668E-09	0.0000	8.113E-12	0.0000	3.691E-12	0.0000	2.247E-09	0.0000
Am-241	1.219E-06	0.0023	2.910E-11	0.0000	3.908E-07	0.0007	3.800E-09	0.0000	1.883E-10	0.0000	1.324E-06	0.0025
C-14	3.566E-12	0.0000	1.668E-10	0.0000	2.633E-07	0.0005	7.821E-08	0.0001	2.707E-08	0.0001	2.024E-10	0.0000
Co-60	5.968E-05	0.1105	8.745E-15	0.0000	5.830E-07	0.0011	2.967E-07	0.0005	3.102E-08	0.0001	2.472E-08	0.0000
Cs-137	5.522E-05	0.1022	4.407E-14	0.0000	2.222E-06	0.0041	1.839E-06	0.0034	5.212E-07	0.0010	1.884E-07	0.0003
H-3	0.000E+00	0.0000	9.222E-09	0.0000	3.990E-08	0.0001	6.112E-09	0.0000	4.488E-09	0.0000	1.994E-11	0.0000
I-129	2.074E-07	0.0004	9.277E-14	0.0000	1.410E-05	0.0261	3.151E-06	0.0058	4.907E-06	0.0091	2.390E-06	0.0044
Ni-63	0.000E+00	0.0000	3.575E-15	0.0000	1.112E-07	0.0002	1.486E-08	0.0000	6.280E-08	0.0001	7.542E-09	0.0000
Np-237	3.481E-05	0.0644	2.236E-11	0.0000	5.352E-06	0.0099	1.706E-07	0.0003	9.300E-10	0.0000	9.074E-07	0.0017
Pa-231	4.552E-09	0.0000	4.458E-14	0.0000	4.988E-09	0.0000	1.006E-09	0.0000	1.143E-12	0.0000	1.692E-09	0.0000
Pb-210	2.222E-13	0.0000	2.873E-17	0.0000	1.223E-10	0.0000	4.039E-12	0.0000	1.691E-12	0.0000	4.117E-11	0.0000
Pu-238	2.643E-09	0.0000	3.196E-11	0.0000	3.909E-07	0.0007	7.603E-09	0.0000	9.418E-11	0.0000	1.324E-06	0.0025
Pu-239	9.025E-09	0.0000	4.386E-11	0.0000	5.234E-07	0.0010	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0033
Pu-241	1.729E-10	0.0000	1.979E-13	0.0000	1.969E-09	0.0000	3.830E-11	0.0000	4.744E-13	0.0000	6.671E-09	0.0000
Ra-226	1.184E-09	0.0000	7.087E-17	0.0000	1.946E-10	0.0000	5.338E-12	0.0000	5.688E-12	0.0000	1.652E-11	0.0000
Se-79	7.978E-11	0.0000	2.526E-15	0.0000	4.655E-07	0.0009	1.179E-06	0.0022	1.222E-07	0.0002	1.574E-08	0.0000
Sn-126	6.188E-05	0.1145	5.240E-14	0.0000	4.712E-08	0.0001	4.348E-08	0.0001	5.218E-09	0.0000	6.372E-08	0.0001
Sr-90	4.178E-07	0.0008	1.666E-13	0.0000	4.148E-05	0.0768	7.921E-06	0.0147	2.042E-06	0.0038	4.689E-07	0.0009
Tc-99	5.887E-10	0.0000	4.836E-15	0.0000	9.608E-06	0.0178	2.271E-08	0.0000	2.319E-07	0.0004	6.499E-09	0.0000
Th-229	1.710E-07	0.0003	6.019E-13	0.0000	7.097E-09	0.0000	1.386E-10	0.0000	8.633E-12	0.0000	2.401E-08	0.0000
Th-230	1.166E-11	0.0000	8.508E-15	0.0000	1.127E-10	0.0000	2.200E-12	0.0000	1.370E-13	0.0000	3.812E-10	0.0000
U-233	4.416E-08	0.0001	2.242E-11	0.0000	7.248E-07	0.0013	2.263E-08	0.0000	4.816E-08	0.0001	9.828E-07	0.0018
U-234	1.148E-08	0.0000	2.203E-11	0.0000	7.144E-07	0.0013	2.230E-08	0.0000	4.747E-08	0.0001	9.687E-07	0.0018
U-235	2.437E-05	0.0451	1.981E-11	0.0000	7.304E-07	0.0014	2.280E-08	0.0000	4.853E-08	0.0001	9.904E-07	0.0018
U-238	5.019E-06	0.0093	1.872E-11	0.0000	9.022E-07	0.0017	2.816E-08	0.0001	5.995E-08	0.0001	1.223E-06	0.0023
Total	2.431E-04	0.4499	9.600E-09	0.0000	7.867E-05	0.1456	1.484E-05	0.0275	8.160E-06	0.0151	1.269E-05	0.0235

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 10
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.606E-08	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-06	0.0054
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.689E-07	0.0007
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.062E-05	0.1122
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.999E-05	0.1110
H-3	0.000E+00	0.0000	0.000E+00	0.0000	7.823E-09	0.0000	6.310E-10	0.0000	9.103E-10	0.0000	6.910E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.476E-05	0.0458
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.964E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.124E-05	0.0763
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.224E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-06	0.0032
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.316E-06	0.0043
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.853E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.406E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-05	0.0195	7.650E-05	0.1416	1.007E-05	0.0186	9.889E-05	0.1830
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.181E-05	0.0774	3.089E-05	0.0572	4.070E-06	0.0075	1.388E-04	0.2569
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.232E-05	0.0968
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.438E-06	0.0156	3.567E-08	0.0001	4.579E-07	0.0008	1.880E-05	0.0348
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.023E-07	0.0004
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.079E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.823E-06	0.0034
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-06	0.0033
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.616E-05	0.0484
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.232E-06	0.0134
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.078E-05	0.1125	1.074E-04	0.1988	1.460E-05	0.0270	5.403E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 11
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.190E-06	0.0022	2.842E-11	0.0000	0.000E+00	0.0000	3.817E-07	0.0007	3.713E-09	0.0000	1.839E-10	0.0000	1.293E-06	0.0024
C-14	3.566E-12	0.0000	1.668E-10	0.0000	0.000E+00	0.0000	2.633E-07	0.0005	7.821E-08	0.0001	2.707E-08	0.0001	2.024E-10	0.0000
Co-60	5.968E-05	0.1105	8.745E-15	0.0000	0.000E+00	0.0000	5.830E-07	0.0011	2.967E-07	0.0005	3.102E-08	0.0001	2.472E-08	0.0000
Cs-137	5.522E-05	0.1022	4.407E-14	0.0000	0.000E+00	0.0000	2.222E-06	0.0041	1.839E-06	0.0034	5.212E-07	0.0010	1.884E-07	0.0003
H-3	0.000E+00	0.0000	9.222E-09	0.0000	0.000E+00	0.0000	3.990E-08	0.0001	6.112E-09	0.0000	4.488E-09	0.0000	1.994E-11	0.0000
I-129	2.074E-07	0.0004	9.277E-14	0.0000	0.000E+00	0.0000	1.410E-05	0.0261	3.151E-06	0.0058	4.907E-06	0.0091	2.390E-06	0.0044
Ni-63	0.000E+00	0.0000	3.575E-15	0.0000	0.000E+00	0.0000	1.112E-07	0.0002	1.486E-08	0.0000	6.280E-08	0.0001	7.542E-09	0.0000
Np-237	3.481E-05	0.0644	2.236E-11	0.0000	0.000E+00	0.0000	5.352E-06	0.0099	1.706E-07	0.0003	9.373E-10	0.0000	9.076E-07	0.0017
Pu-238	2.644E-09	0.0000	3.196E-11	0.0000	0.000E+00	0.0000	3.910E-07	0.0007	7.605E-09	0.0000	9.813E-11	0.0000	1.325E-06	0.0025
Pu-239	9.026E-09	0.0000	4.386E-11	0.0000	0.000E+00	0.0000	5.234E-07	0.0010	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0033
Pu-241	2.876E-08	0.0001	8.804E-13	0.0000	0.000E+00	0.0000	1.114E-08	0.0000	1.276E-10	0.0000	4.890E-12	0.0000	3.772E-08	0.0001
Se-79	7.978E-11	0.0000	2.526E-15	0.0000	0.000E+00	0.0000	4.655E-07	0.0009	1.179E-06	0.0022	1.222E-07	0.0002	1.574E-08	0.0000
Sn-126	6.188E-05	0.1145	5.240E-14	0.0000	0.000E+00	0.0000	4.712E-08	0.0001	4.348E-08	0.0001	5.218E-09	0.0000	6.372E-08	0.0001
Sr-90	4.178E-07	0.0008	1.666E-13	0.0000	0.000E+00	0.0000	4.148E-05	0.0768	7.921E-06	0.0147	2.042E-06	0.0038	4.689E-07	0.0009
Tc-99	5.887E-10	0.0000	4.836E-15	0.0000	0.000E+00	0.0000	9.608E-06	0.0178	2.271E-08	0.0000	2.319E-07	0.0004	6.499E-09	0.0000
U-233	2.151E-07	0.0004	2.302E-11	0.0000	0.000E+00	0.0000	7.318E-07	0.0014	2.276E-08	0.0000	4.817E-08	0.0001	1.007E-06	0.0019
U-234	1.267E-08	0.0000	2.203E-11	0.0000	0.000E+00	0.0000	7.147E-07	0.0013	2.231E-08	0.0000	4.747E-08	0.0001	9.690E-07	0.0018
U-235	2.439E-05	0.0452	1.991E-11	0.0000	0.000E+00	0.0000	7.370E-07	0.0014	2.381E-08	0.0000	4.854E-08	0.0001	9.943E-07	0.0018
U-238	5.019E-06	0.0093	1.873E-11	0.0000	0.000E+00	0.0000	9.023E-07	0.0017	2.817E-08	0.0001	5.995E-08	0.0001	1.223E-06	0.0023
Total	2.431E-04	0.4499	9.600E-09	0.0000	0.000E+00	0.0000	7.867E-05	0.1456	1.484E-05	0.0275	8.160E-06	0.0151	1.269E-05	0.0235

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 12
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.869E-06	0.0053
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.689E-07	0.0007
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.062E-05	0.1122
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.999E-05	0.1110
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.823E-09	0.0000	6.310E-10	0.0000	9.103E-10	0.0000	6.910E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.476E-05	0.0458
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.964E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.124E-05	0.0763
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.726E-06	0.0032
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.316E-06	0.0043
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.775E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-05	0.0195	7.650E-05	0.1416	1.007E-05	0.0186	9.889E-05	0.1830
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.181E-05	0.0774	3.089E-05	0.0572	4.070E-06	0.0075	1.388E-04	0.2569
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.232E-05	0.0968
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.438E-06	0.0156	3.567E-08	0.0001	4.579E-07	0.0008	1.880E-05	0.0348
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E-06	0.0037
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.766E-06	0.0033
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.620E-05	0.0485
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.233E-06	0.0134
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.078E-05	0.1125	1.074E-04	0.1988	1.460E-05	0.0270	5.403E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 13
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.800E-12	4.226E-05	2.933E-06	9.037E-08	4.864E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.392E-05
Am-241	1.140E-05	4.309E+01	4.191E-01	2.076E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.895E+02
C-14	3.213E+01	4.517E+04	1.374E+04	4.717E+03	3.448E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.366E+04
Co-60	9.998E-06	3.019E+03	1.536E+03	1.607E+02	1.280E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.844E+03
Cs-137	1.114E-05	1.682E+03	1.392E+03	3.946E+02	1.426E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.612E+03
H-3	3.981E+03	1.021E+05	1.584E+04	1.158E+04	5.087E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.296E+05
I-129	1.130E-05	8.534E+02	1.907E+02	2.969E+02	1.446E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.486E+03
Ni-63	1.132E-05	2.136E+03	2.855E+02	1.206E+03	1.449E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.773E+03
Np-237	1.140E-05	8.604E+02	2.742E+01	1.495E-01	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.034E+03
Pa-231	2.413E-10	8.899E-03	1.646E-03	2.385E-06	3.088E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.364E-02
Pb-210	2.286E-16	1.082E-08	4.635E-10	1.743E-10	2.926E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.438E-08
Pu-238	1.132E-05	4.275E+01	8.315E-01	1.030E-02	1.448E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.884E+02
Pu-239	1.140E-05	4.309E+01	8.380E-01	1.038E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.899E+02
Pu-241	1.087E-05	4.107E+01	7.987E-01	9.893E-03	1.391E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.810E+02
Ra-226	2.223E-14	3.162E-06	6.637E-08	7.991E-08	2.846E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.593E-06
Se-79	1.043E-05	3.947E+03	9.995E+03	1.036E+03	1.335E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.511E+04
Sn-126	1.043E-05	9.870E+01	9.108E+01	1.093E+01	1.335E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.342E+02
Sr-90	1.113E-05	1.261E+04	2.407E+03	6.206E+02	1.425E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.578E+04
Tc-99	1.043E-05	1.973E+05	4.665E+02	4.763E+03	1.335E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.027E+05
Th-229	1.077E-09	4.255E-03	9.393E-05	6.827E-06	1.379E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.814E-02
Th-230	1.027E-10	4.056E-04	8.954E-06	6.508E-07	1.314E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.729E-03
U-233	1.140E-05	1.076E+02	3.360E+00	7.153E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.641E+02
U-234	1.140E-05	1.076E+02	3.360E+00	7.153E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.641E+02
U-235	1.140E-05	1.076E+02	3.360E+00	7.153E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.641E+02
U-238	1.140E-05	1.076E+02	3.360E+00	7.153E+00	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.641E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page  14
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.296E-08	0.0000	5.937E-14	0.0000	1.730E-09	0.0000	8.371E-12	0.0000	3.828E-12	0.0000	2.331E-09	0.0000
Am-241	1.217E-06	0.0023	2.907E-11	0.0000	3.904E-07	0.0007	3.796E-09	0.0000	1.881E-10	0.0000	1.322E-06	0.0025
C-14	8.418E-13	0.0000	3.939E-11	0.0000	6.258E-08	0.0001	1.903E-08	0.0000	6.535E-09	0.0000	4.777E-11	0.0000
Co-60	5.231E-05	0.1000	7.665E-15	0.0000	5.111E-07	0.0010	2.600E-07	0.0005	2.720E-08	0.0001	2.167E-08	0.0000
Cs-137	5.395E-05	0.1031	4.305E-14	0.0000	2.171E-06	0.0041	1.796E-06	0.0034	5.092E-07	0.0010	1.840E-07	0.0004
H-3	0.000E+00	0.0000	3.212E-09	0.0000	1.394E-08	0.0000	2.163E-09	0.0000	1.581E-09	0.0000	6.943E-12	0.0000
I-129	2.054E-07	0.0004	9.187E-14	0.0000	1.397E-05	0.0267	3.121E-06	0.0060	4.859E-06	0.0093	2.367E-06	0.0045
Ni-63	0.000E+00	0.0000	3.548E-15	0.0000	1.104E-07	0.0002	1.475E-08	0.0000	6.232E-08	0.0001	7.485E-09	0.0000
Np-237	3.479E-05	0.0665	2.234E-11	0.0000	5.348E-06	0.0102	1.704E-07	0.0003	9.293E-10	0.0000	9.068E-07	0.0017
Pa-231	4.681E-09	0.0000	4.584E-14	0.0000	5.129E-09	0.0000	1.035E-09	0.0000	1.175E-12	0.0000	1.741E-09	0.0000
Pb-210	2.340E-13	0.0000	3.026E-17	0.0000	1.288E-10	0.0000	4.252E-12	0.0000	1.780E-12	0.0000	4.336E-11	0.0000
Pu-238	2.622E-09	0.0000	3.170E-11	0.0000	3.878E-07	0.0007	7.543E-09	0.0000	9.343E-11	0.0000	1.314E-06	0.0025
Pu-239	9.025E-09	0.0000	4.386E-11	0.0000	5.233E-07	0.0010	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0034
Pu-241	1.648E-10	0.0000	1.886E-13	0.0000	1.877E-09	0.0000	3.650E-11	0.0000	4.521E-13	0.0000	6.358E-09	0.0000
Ra-226	1.235E-09	0.0000	7.394E-17	0.0000	2.030E-10	0.0000	5.570E-12	0.0000	5.935E-12	0.0000	1.723E-11	0.0000
Se-79	7.293E-11	0.0000	2.309E-15	0.0000	4.255E-07	0.0008	1.078E-06	0.0021	1.118E-07	0.0002	1.439E-08	0.0000
Sn-126	5.658E-05	0.1081	4.790E-14	0.0000	4.308E-08	0.0001	3.975E-08	0.0001	4.770E-09	0.0000	5.825E-08	0.0001
Sr-90	4.078E-07	0.0008	1.626E-13	0.0000	4.048E-05	0.0773	7.731E-06	0.0148	1.993E-06	0.0038	4.576E-07	0.0009
Tc-99	5.382E-10	0.0000	4.421E-15	0.0000	8.784E-06	0.0168	2.077E-08	0.0000	2.120E-07	0.0004	5.942E-09	0.0000
Th-229	1.759E-07	0.0003	6.191E-13	0.0000	7.299E-09	0.0000	1.425E-10	0.0000	8.876E-12	0.0000	2.470E-08	0.0000
Th-230	1.200E-11	0.0000	8.751E-15	0.0000	1.159E-10	0.0000	2.262E-12	0.0000	1.409E-13	0.0000	3.921E-10	0.0000
U-233	4.415E-08	0.0001	2.242E-11	0.0000	7.247E-07	0.0014	2.262E-08	0.0000	4.815E-08	0.0001	9.826E-07	0.0019
U-234	1.147E-08	0.0000	2.202E-11	0.0000	7.143E-07	0.0014	2.230E-08	0.0000	4.746E-08	0.0001	9.685E-07	0.0019
U-235	2.436E-05	0.0465	1.981E-11	0.0000	7.302E-07	0.0014	2.279E-08	0.0000	4.852E-08	0.0001	9.901E-07	0.0019
U-238	5.018E-06	0.0096	1.872E-11	0.0000	9.020E-07	0.0017	2.816E-08	0.0001	5.994E-08	0.0001	1.223E-06	0.0023
Total	2.291E-04	0.4377	3.462E-09	0.0000	7.631E-05	0.1458	1.437E-05	0.0275	7.993E-06	0.0153	1.263E-05	0.0241

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 15
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.703E-08	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.934E-06	0.0056
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.824E-08	0.0002
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.313E-05	0.1015
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.861E-05	0.1120
H-3	0.000E+00	0.0000	0.000E+00	0.0000	7.826E-09	0.0000	6.312E-10	0.0000	9.101E-10	0.0000	3.027E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-05	0.0469
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.121E-05	0.0787
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.784E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.712E-06	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.316E-06	0.0044
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.436E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.467E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.054E-05	0.0201	7.657E-05	0.1463	1.008E-05	0.0193	9.882E-05	0.1888
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.185E-05	0.0800	3.091E-05	0.0591	4.073E-06	0.0078	1.336E-04	0.2552
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.107E-05	0.0976
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.446E-06	0.0161	3.570E-08	0.0001	4.583E-07	0.0009	1.796E-05	0.0343
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.080E-07	0.0004
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.223E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.822E-06	0.0035
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.764E-06	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.615E-05	0.0500
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.231E-06	0.0138
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.084E-05	0.1162	1.075E-04	0.2054	1.462E-05	0.0279	5.234E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

0

Radon Pathway	Radionuclides Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 16
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.188E-06	0.0023	2.837E-11	0.0000	0.000E+00	0.0000	3.811E-07	0.0007	3.707E-09	0.0000	1.836E-10	0.0000	1.291E-06	0.0025
C-14	8.418E-13	0.0000	3.939E-11	0.0000	0.000E+00	0.0000	6.258E-08	0.0001	1.903E-08	0.0000	6.535E-09	0.0000	4.777E-11	0.0000
Co-60	5.231E-05	0.1000	7.665E-15	0.0000	0.000E+00	0.0000	5.111E-07	0.0010	2.600E-07	0.0005	2.720E-08	0.0001	2.167E-08	0.0000
Cs-137	5.395E-05	0.1031	4.305E-14	0.0000	0.000E+00	0.0000	2.171E-06	0.0041	1.796E-06	0.0034	5.092E-07	0.0010	1.840E-07	0.0004
H-3	0.000E+00	0.0000	3.212E-09	0.0000	0.000E+00	0.0000	1.394E-08	0.0000	2.163E-09	0.0000	1.581E-09	0.0000	6.943E-12	0.0000
I-129	2.054E-07	0.0004	9.187E-14	0.0000	0.000E+00	0.0000	1.397E-05	0.0267	3.121E-06	0.0060	4.859E-06	0.0093	2.367E-06	0.0045
Ni-63	0.000E+00	0.0000	3.548E-15	0.0000	0.000E+00	0.0000	1.104E-07	0.0002	1.475E-08	0.0000	6.232E-08	0.0001	7.485E-09	0.0000
Np-237	3.479E-05	0.0665	2.235E-11	0.0000	0.000E+00	0.0000	5.348E-06	0.0102	1.704E-07	0.0003	9.368E-10	0.0000	9.069E-07	0.0017
Pu-238	2.623E-09	0.0000	3.171E-11	0.0000	0.000E+00	0.0000	3.879E-07	0.0007	7.544E-09	0.0000	9.748E-11	0.0000	1.314E-06	0.0025
Pu-239	9.026E-09	0.0000	4.386E-11	0.0000	0.000E+00	0.0000	5.233E-07	0.0010	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0034
Pu-241	2.927E-08	0.0001	8.834E-13	0.0000	0.000E+00	0.0000	1.121E-08	0.0000	1.274E-10	0.0000	4.948E-12	0.0000	3.797E-08	0.0001
Se-79	7.293E-11	0.0000	2.309E-15	0.0000	0.000E+00	0.0000	4.255E-07	0.0008	1.078E-06	0.0021	1.118E-07	0.0002	1.439E-08	0.0000
Sn-126	5.658E-05	0.1081	4.790E-14	0.0000	0.000E+00	0.0000	4.308E-08	0.0001	3.975E-08	0.0001	4.770E-09	0.0000	5.825E-08	0.0001
Sr-90	4.078E-07	0.0008	1.626E-13	0.0000	0.000E+00	0.0000	4.048E-05	0.0773	7.731E-06	0.0148	1.993E-06	0.0038	4.576E-07	0.0009
Tc-99	5.382E-10	0.0000	4.421E-15	0.0000	0.000E+00	0.0000	8.784E-06	0.0168	2.077E-08	0.0000	2.120E-07	0.0004	5.942E-09	0.0000
U-233	2.200E-07	0.0004	2.303E-11	0.0000	0.000E+00	0.0000	7.319E-07	0.0014	2.276E-08	0.0000	4.815E-08	0.0001	1.007E-06	0.0019
U-234	1.272E-08	0.0000	2.203E-11	0.0000	0.000E+00	0.0000	7.146E-07	0.0014	2.230E-08	0.0000	4.746E-08	0.0001	9.688E-07	0.0019
U-235	2.439E-05	0.0466	1.991E-11	0.0000	0.000E+00	0.0000	7.371E-07	0.0014	2.384E-08	0.0000	4.853E-08	0.0001	9.942E-07	0.0019
U-238	5.018E-06	0.0096	1.872E-11	0.0000	0.000E+00	0.0000	9.021E-07	0.0017	2.816E-08	0.0001	5.994E-08	0.0001	1.223E-06	0.0023
Total	2.291E-04	0.4377	3.462E-09	0.0000	0.000E+00	0.0000	7.631E-05	0.1458	1.437E-05	0.0275	7.993E-06	0.0153	1.263E-05	0.0241

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 17
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.864E-06	0.0055
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.824E-08	0.0002
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.313E-05	0.1015
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.861E-05	0.1120
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.826E-09	0.0000	6.312E-10	0.0000	9.101E-10	0.0000	3.027E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-05	0.0469
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.121E-05	0.0787
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.712E-06	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.316E-06	0.0044
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.858E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.054E-05	0.0201	7.657E-05	0.1463	1.008E-05	0.0193	9.882E-05	0.1888
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.185E-05	0.0800	3.091E-05	0.0591	4.073E-06	0.0078	1.336E-04	0.2552
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.107E-05	0.0976
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.446E-06	0.0161	3.570E-08	0.0001	4.583E-07	0.0009	1.796E-05	0.0343
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.030E-06	0.0039
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.766E-06	0.0034
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.619E-05	0.0500
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.231E-06	0.0138
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.084E-05	0.1162	1.075E-04	0.2054	1.462E-05	0.0279	5.234E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 18
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.346E-11	3.356E-04	9.867E-06	7.357E-07	4.284E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.745E-04
Am-241	1.140E-05	4.307E+01	4.189E-01	2.075E-02	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.894E+02
C-14	1.789E+00	2.515E+03	7.651E+02	2.627E+02	1.920E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.545E+03
Co-60	7.682E-06	2.320E+03	1.180E+03	1.234E+02	9.834E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.722E+03
Cs-137	1.063E-05	1.606E+03	1.329E+03	3.767E+02	1.361E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.447E+03
H-3	4.827E+02	1.238E+04	1.921E+03	1.404E+03	6.167E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.571E+04
I-129	1.108E-05	8.370E+02	1.870E+02	2.912E+02	1.418E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.457E+03
Ni-63	1.115E-05	2.104E+03	2.812E+02	1.188E+03	1.427E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.716E+03
Np-237	1.138E-05	8.592E+02	2.738E+01	1.493E-01	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.032E+03
Pa-231	7.235E-10	2.710E-02	5.326E-03	6.537E-06	9.261E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.170E-02
Pb-210	6.075E-15	2.502E-07	9.690E-09	3.762E-09	7.776E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.414E-07
Pu-238	1.114E-05	4.208E+01	8.183E-01	1.014E-02	1.426E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.855E+02
Pu-239	1.140E-05	4.309E+01	8.379E-01	1.038E-02	1.460E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.899E+02
Pu-241	9.870E-06	3.729E+01	7.253E-01	8.984E-03	1.263E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.644E+02
Ra-226	2.000E-13	2.960E-05	7.492E-07	8.273E-07	2.560E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.374E-05
Se-79	8.715E-06	3.298E+03	8.353E+03	8.663E+02	1.116E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.263E+04
Sn-126	8.715E-06	8.249E+01	7.612E+01	9.135E+00	1.116E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.793E+02
Sr-90	1.061E-05	1.201E+04	2.293E+03	5.913E+02	1.358E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.503E+04
Tc-99	8.715E-06	1.649E+05	3.899E+02	3.981E+03	1.116E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.694E+05
Th-229	3.230E-09	1.239E-02	2.521E-04	1.662E-05	4.134E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.400E-02
Th-230	3.079E-10	1.181E-03	2.404E-05	1.585E-06	3.942E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.148E-03
U-233	1.140E-05	1.076E+02	3.359E+00	7.150E+00	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.640E+02
U-234	1.140E-05	1.076E+02	3.359E+00	7.150E+00	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.640E+02
U-235	1.140E-05	1.076E+02	3.359E+00	7.150E+00	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.640E+02
U-238	1.140E-05	1.076E+02	3.359E+00	7.150E+00	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.640E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 19
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.466E-08	0.0000	6.376E-14	0.0000	1.858E-09	0.0000	8.894E-12	0.0000	4.111E-12	0.0000	2.504E-09	0.0000
Am-241	1.214E-06	0.0025	2.899E-11	0.0000	3.894E-07	0.0008	3.787E-09	0.0000	1.876E-10	0.0000	1.319E-06	0.0027
C-14	4.683E-14	0.0000	2.191E-12	0.0000	3.482E-09	0.0000	1.059E-09	0.0000	3.636E-10	0.0000	2.658E-12	0.0000
Co-60	4.020E-05	0.0813	5.890E-15	0.0000	3.927E-07	0.0008	1.998E-07	0.0004	2.090E-08	0.0000	1.665E-08	0.0000
Cs-137	5.149E-05	0.1041	4.109E-14	0.0000	2.072E-06	0.0042	1.714E-06	0.0035	4.860E-07	0.0010	1.756E-07	0.0004
H-3	0.000E+00	0.0000	3.891E-10	0.0000	1.688E-09	0.0000	2.620E-10	0.0000	1.915E-10	0.0000	8.412E-13	0.0000
I-129	2.015E-07	0.0004	9.011E-14	0.0000	1.370E-05	0.0277	3.061E-06	0.0062	4.766E-06	0.0096	2.321E-06	0.0047
Ni-63	0.000E+00	0.0000	3.494E-15	0.0000	1.087E-07	0.0002	1.453E-08	0.0000	6.138E-08	0.0001	7.372E-09	0.0000
Np-237	3.474E-05	0.0702	2.231E-11	0.0000	5.340E-06	0.0108	1.702E-07	0.0003	9.280E-10	0.0000	9.055E-07	0.0018
Pa-231	4.940E-09	0.0000	4.838E-14	0.0000	5.413E-09	0.0000	1.092E-09	0.0000	1.240E-12	0.0000	1.837E-09	0.0000
Pb-210	2.590E-13	0.0000	3.348E-17	0.0000	1.425E-10	0.0000	4.704E-12	0.0000	1.970E-12	0.0000	4.798E-11	0.0000
Pu-238	2.581E-09	0.0000	3.120E-11	0.0000	3.817E-07	0.0008	7.424E-09	0.0000	9.196E-11	0.0000	1.293E-06	0.0026
Pu-239	9.023E-09	0.0000	4.385E-11	0.0000	5.233E-07	0.0011	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0036
Pu-241	1.497E-10	0.0000	1.713E-13	0.0000	1.704E-09	0.0000	3.314E-11	0.0000	4.105E-13	0.0000	5.773E-09	0.0000
Ra-226	1.342E-09	0.0000	8.033E-17	0.0000	2.206E-10	0.0000	6.052E-12	0.0000	6.448E-12	0.0000	1.872E-11	0.0000
Se-79	6.096E-11	0.0000	1.930E-15	0.0000	3.557E-07	0.0007	9.007E-07	0.0018	9.341E-08	0.0002	1.203E-08	0.0000
Sn-126	4.729E-05	0.0956	4.004E-14	0.0000	3.600E-08	0.0001	3.322E-08	0.0001	3.987E-09	0.0000	4.869E-08	0.0001
Sr-90	3.885E-07	0.0008	1.549E-13	0.0000	3.857E-05	0.0780	7.365E-06	0.0149	1.899E-06	0.0038	4.360E-07	0.0009
Tc-99	4.498E-10	0.0000	3.695E-15	0.0000	7.341E-06	0.0148	1.736E-08	0.0000	1.772E-07	0.0004	4.966E-09	0.0000
Th-229	1.856E-07	0.0004	6.533E-13	0.0000	7.702E-09	0.0000	1.503E-10	0.0000	9.362E-12	0.0000	2.606E-08	0.0001
Th-230	1.266E-11	0.0000	9.235E-15	0.0000	1.223E-10	0.0000	2.387E-12	0.0000	1.486E-13	0.0000	4.138E-10	0.0000
U-233	4.413E-08	0.0001	2.241E-11	0.0000	7.244E-07	0.0015	2.261E-08	0.0000	4.813E-08	0.0001	9.822E-07	0.0020
U-234	1.147E-08	0.0000	2.202E-11	0.0000	7.140E-07	0.0014	2.229E-08	0.0000	4.744E-08	0.0001	9.681E-07	0.0020
U-235	2.435E-05	0.0492	1.980E-11	0.0000	7.299E-07	0.0015	2.278E-08	0.0000	4.850E-08	0.0001	9.897E-07	0.0020
U-238	5.016E-06	0.0101	1.871E-11	0.0000	9.016E-07	0.0018	2.814E-08	0.0001	5.991E-08	0.0001	1.223E-06	0.0025
Total	2.052E-04	0.4149	6.019E-10	0.0000	7.230E-05	0.1462	1.360E-05	0.0275	7.714E-06	0.0156	1.251E-05	0.0253

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page  20
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.904E-08	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.927E-06	0.0059
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.910E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.083E-05	0.0826
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.594E-05	0.1131
H-3	0.000E+00	0.0000	0.000E+00	0.0000	7.829E-09	0.0000	6.311E-10	0.0000	9.111E-10	0.0000	1.190E-08	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.405E-05	0.0486
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.920E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.115E-05	0.0832
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.328E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.975E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.685E-06	0.0034
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-06	0.0047
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.661E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-05	0.0213	7.669E-05	0.1551	1.010E-05	0.0204	9.870E-05	0.1996
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.192E-05	0.0848	3.096E-05	0.0626	4.080E-06	0.0082	1.244E-04	0.2515
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.866E-05	0.0984
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.459E-06	0.0171	3.576E-08	0.0001	4.590E-07	0.0009	1.650E-05	0.0334
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.195E-07	0.0004
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.513E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.821E-06	0.0037
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.763E-06	0.0036
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.614E-05	0.0529
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.228E-06	0.0146
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-05	0.1232	1.077E-04	0.2177	1.464E-05	0.0296	4.946E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 21
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.185E-06	0.0024	2.828E-11	0.0000	0.000E+00	0.0000	3.798E-07	0.0008	3.695E-09	0.0000	1.830E-10	0.0000	1.287E-06	0.0026
C-14	4.683E-14	0.0000	2.191E-12	0.0000	0.000E+00	0.0000	3.482E-09	0.0000	1.059E-09	0.0000	3.636E-10	0.0000	2.658E-12	0.0000
Co-60	4.020E-05	0.0813	5.890E-15	0.0000	0.000E+00	0.0000	3.927E-07	0.0008	1.998E-07	0.0004	2.090E-08	0.0000	1.665E-08	0.0000
Cs-137	5.149E-05	0.1041	4.109E-14	0.0000	0.000E+00	0.0000	2.072E-06	0.0042	1.714E-06	0.0035	4.860E-07	0.0010	1.756E-07	0.0004
H-3	0.000E+00	0.0000	3.891E-10	0.0000	0.000E+00	0.0000	1.688E-09	0.0000	2.620E-10	0.0000	1.915E-10	0.0000	8.412E-13	0.0000
I-129	2.015E-07	0.0004	9.011E-14	0.0000	0.000E+00	0.0000	1.370E-05	0.0277	3.061E-06	0.0062	4.766E-06	0.0096	2.321E-06	0.0047
Ni-63	0.000E+00	0.0000	3.494E-15	0.0000	0.000E+00	0.0000	1.087E-07	0.0002	1.453E-08	0.0000	6.138E-08	0.0001	7.372E-09	0.0000
Np-237	3.474E-05	0.0702	2.231E-11	0.0000	0.000E+00	0.0000	5.340E-06	0.0108	1.702E-07	0.0003	9.359E-10	0.0000	9.056E-07	0.0018
Pu-238	2.582E-09	0.0000	3.121E-11	0.0000	0.000E+00	0.0000	3.818E-07	0.0008	7.426E-09	0.0000	9.621E-11	0.0000	1.293E-06	0.0026
Pu-239	9.024E-09	0.0000	4.385E-11	0.0000	0.000E+00	0.0000	5.233E-07	0.0011	1.018E-08	0.0000	1.261E-10	0.0000	1.773E-06	0.0036
Pu-241	3.021E-08	0.0001	8.889E-13	0.0000	0.000E+00	0.0000	1.134E-08	0.0000	1.270E-10	0.0000	5.054E-12	0.0000	3.842E-08	0.0001
Se-79	6.096E-11	0.0000	1.930E-15	0.0000	0.000E+00	0.0000	3.557E-07	0.0007	9.007E-07	0.0018	9.341E-08	0.0002	1.203E-08	0.0000
Sn-126	4.729E-05	0.0956	4.004E-14	0.0000	0.000E+00	0.0000	3.600E-08	0.0001	3.322E-08	0.0001	3.987E-09	0.0000	4.869E-08	0.0001
Sr-90	3.885E-07	0.0008	1.549E-13	0.0000	0.000E+00	0.0000	3.857E-05	0.0780	7.365E-06	0.0149	1.899E-06	0.0038	4.360E-07	0.0009
Tc-99	4.498E-10	0.0000	3.695E-15	0.0000	0.000E+00	0.0000	7.341E-06	0.0148	1.736E-08	0.0000	1.772E-07	0.0004	4.966E-09	0.0000
U-233	2.297E-07	0.0005	2.306E-11	0.0000	0.000E+00	0.0000	7.319E-07	0.0015	2.276E-08	0.0000	4.813E-08	0.0001	1.008E-06	0.0020
U-234	1.282E-08	0.0000	2.202E-11	0.0000	0.000E+00	0.0000	7.143E-07	0.0014	2.230E-08	0.0000	4.744E-08	0.0001	9.684E-07	0.0020
U-235	2.438E-05	0.0493	1.991E-11	0.0000	0.000E+00	0.0000	7.372E-07	0.0015	2.389E-08	0.0000	4.851E-08	0.0001	9.940E-07	0.0020
U-238	5.016E-06	0.0101	1.871E-11	0.0000	0.000E+00	0.0000	9.017E-07	0.0018	2.815E-08	0.0001	5.992E-08	0.0001	1.223E-06	0.0025
Total	2.052E-04	0.4149	6.019E-10	0.0000	0.000E+00	0.0000	7.230E-05	0.1462	1.360E-05	0.0275	7.714E-06	0.0156	1.251E-05	0.0253

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 22
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.855E-06	0.0058
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.910E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.083E-05	0.0826
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.594E-05	0.1131
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.829E-09	0.0000	6.311E-10	0.0000	9.111E-10	0.0000	1.190E-08	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.405E-05	0.0486
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.920E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.115E-05	0.0832
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.685E-06	0.0034
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.315E-06	0.0047
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.011E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.055E-05	0.0213	7.669E-05	0.1551	1.010E-05	0.0204	9.870E-05	0.1996
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.192E-05	0.0848	3.096E-05	0.0626	4.080E-06	0.0082	1.244E-04	0.2515
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.866E-05	0.0984
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.459E-06	0.0171	3.576E-08	0.0001	4.590E-07	0.0009	1.650E-05	0.0334
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.041E-06	0.0041
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.765E-06	0.0036
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.618E-05	0.0529
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.228E-06	0.0146
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.094E-05	0.1232	1.077E-04	0.2177	1.464E-05	0.0296	4.946E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 23
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	3.453E-10	3.326E-03	3.770E-05	7.343E-06	4.420E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.791E-03
Am-241	1.136E-05	4.293E+01	4.175E-01	2.068E-02	1.454E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.888E+02
C-14	7.146E-05	1.005E-01	3.058E-02	1.050E-02	7.670E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.416E-01
Co-60	3.055E-06	9.226E+02	4.695E+02	4.910E+01	3.911E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.480E+03
Cs-137	9.033E-06	1.364E+03	1.129E+03	3.199E+02	1.156E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.928E+03
H-3	2.958E-01	7.586E+00	1.178E+00	8.608E-01	3.779E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.628E+00
I-129	1.035E-05	7.822E+02	1.748E+02	2.721E+02	1.325E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.362E+03
Ni-63	1.057E-05	1.995E+03	2.667E+02	1.127E+03	1.353E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.524E+03
Np-237	1.132E-05	8.549E+02	2.724E+01	1.486E-01	1.450E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.027E+03
Pa-231	2.408E-09	9.068E-02	1.818E-02	2.104E-05	3.082E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.397E-01
Pb-210	2.131E-13	8.280E-06	2.880E-07	1.175E-07	2.728E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.141E-05
Pu-238	1.053E-05	3.980E+01	7.740E-01	9.588E-03	1.348E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.754E+02
Pu-239	1.140E-05	4.306E+01	8.374E-01	1.037E-02	1.459E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.898E+02
Pu-241	7.044E-06	2.662E+01	5.176E-01	6.412E-03	9.017E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.173E+02
Ra-226	2.218E-12	3.329E-04	8.952E-06	9.623E-06	2.839E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.799E-04
Se-79	4.651E-06	1.760E+03	4.458E+03	4.623E+02	5.954E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.741E+03
Sn-126	4.651E-06	4.403E+01	4.063E+01	4.876E+00	5.954E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.491E+02
Sr-90	8.951E-06	1.014E+04	1.936E+03	4.990E+02	1.146E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.268E+04
Tc-99	4.652E-06	8.803E+04	2.081E+02	2.125E+03	5.954E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.042E+04
Th-229	1.075E-08	4.082E-02	8.050E-04	5.086E-05	1.377E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.793E-01
Th-230	1.026E-09	3.893E-03	7.677E-05	4.851E-06	1.313E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.710E-02
U-233	1.138E-05	1.074E+02	3.354E+00	7.139E+00	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.636E+02
U-234	1.138E-05	1.074E+02	3.354E+00	7.139E+00	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.636E+02
U-235	1.138E-05	1.074E+02	3.354E+00	7.139E+00	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.636E+02
U-238	1.138E-05	1.074E+02	3.354E+00	7.139E+00	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.636E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 24
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.107E-08	0.0001	8.033E-14	0.0000	2.340E-09	0.0000	1.078E-11	0.0000	5.178E-12	0.0000	3.154E-09	0.0000
Am-241	1.203E-06	0.0028	2.873E-11	0.0000	3.859E-07	0.0009	3.752E-09	0.0000	1.859E-10	0.0000	1.307E-06	0.0031
C-14	1.865E-18	0.0000	8.726E-17	0.0000	1.387E-13	0.0000	4.221E-14	0.0000	1.449E-14	0.0000	1.058E-16	0.0000
Co-60	1.599E-05	0.0375	2.343E-15	0.0000	1.562E-07	0.0004	7.947E-08	0.0002	8.311E-09	0.0000	6.621E-09	0.0000
Cs-137	4.373E-05	0.1026	3.490E-14	0.0000	1.760E-06	0.0041	1.456E-06	0.0034	4.128E-07	0.0010	1.492E-07	0.0003
H-3	0.000E+00	0.0000	2.378E-13	0.0000	1.032E-12	0.0000	1.602E-13	0.0000	1.171E-13	0.0000	5.141E-16	0.0000
I-129	1.883E-07	0.0004	8.420E-14	0.0000	1.280E-05	0.0300	2.860E-06	0.0067	4.454E-06	0.0104	2.169E-06	0.0051
Ni-63	0.000E+00	0.0000	3.314E-15	0.0000	1.031E-07	0.0002	1.377E-08	0.0000	5.821E-08	0.0001	6.991E-09	0.0000
Np-237	3.456E-05	0.0810	2.220E-11	0.0000	5.313E-06	0.0125	1.693E-07	0.0004	9.233E-10	0.0000	9.009E-07	0.0021
Pa-231	5.843E-09	0.0000	5.722E-14	0.0000	6.403E-09	0.0000	1.292E-09	0.0000	1.466E-12	0.0000	2.172E-09	0.0000
Pb-210	3.611E-13	0.0000	4.668E-17	0.0000	1.987E-10	0.0000	6.548E-12	0.0000	2.743E-12	0.0000	6.690E-11	0.0000
Pu-238	2.441E-09	0.0000	2.951E-11	0.0000	3.610E-07	0.0008	7.021E-09	0.0000	8.697E-11	0.0000	1.223E-06	0.0029
Pu-239	9.018E-09	0.0000	4.383E-11	0.0000	5.229E-07	0.0012	1.017E-08	0.0000	1.260E-10	0.0000	1.772E-06	0.0042
Pu-241	1.068E-10	0.0000	1.222E-13	0.0000	1.216E-09	0.0000	2.365E-11	0.0000	2.930E-13	0.0000	4.120E-09	0.0000
Ra-226	1.761E-09	0.0000	1.054E-16	0.0000	2.894E-10	0.0000	7.944E-12	0.0000	8.462E-12	0.0000	2.456E-11	0.0000
Se-79	3.253E-11	0.0000	1.030E-15	0.0000	1.898E-07	0.0004	4.807E-07	0.0011	4.985E-08	0.0001	6.420E-09	0.0000
Sn-126	2.524E-05	0.0592	2.137E-14	0.0000	1.922E-08	0.0000	1.773E-08	0.0000	2.128E-09	0.0000	2.599E-08	0.0001
Sr-90	3.279E-07	0.0008	1.307E-13	0.0000	3.255E-05	0.0763	6.216E-06	0.0146	1.602E-06	0.0038	3.680E-07	0.0009
Tc-99	2.401E-10	0.0000	1.972E-15	0.0000	3.918E-06	0.0092	9.264E-09	0.0000	9.459E-08	0.0002	2.651E-09	0.0000
Th-229	2.196E-07	0.0005	7.730E-13	0.0000	9.112E-09	0.0000	1.778E-10	0.0000	1.106E-11	0.0000	3.084E-08	0.0001
Th-230	1.498E-11	0.0000	1.093E-14	0.0000	1.447E-10	0.0000	2.823E-12	0.0000	1.756E-13	0.0000	4.897E-10	0.0000
U-233	4.407E-08	0.0001	2.238E-11	0.0000	7.233E-07	0.0017	2.258E-08	0.0001	4.806E-08	0.0001	9.807E-07	0.0023
U-234	1.145E-08	0.0000	2.198E-11	0.0000	7.129E-07	0.0017	2.225E-08	0.0001	4.737E-08	0.0001	9.667E-07	0.0023
U-235	2.431E-05	0.0570	1.977E-11	0.0000	7.288E-07	0.0017	2.275E-08	0.0001	4.843E-08	0.0001	9.882E-07	0.0023
U-238	5.008E-06	0.0117	1.868E-11	0.0000	9.002E-07	0.0021	2.810E-08	0.0001	5.982E-08	0.0001	1.221E-06	0.0029
Total	1.509E-04	0.3538	2.086E-10	0.0000	6.117E-05	0.1434	1.142E-05	0.0268	6.887E-06	0.0162	1.214E-05	0.0285

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 25
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.658E-08	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.900E-06	0.0068
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.956E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.624E-05	0.0381
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.751E-05	0.1114
H-3	0.000E+00	0.0000	0.000E+00	0.0000	7.829E-09	0.0000	6.307E-10	0.0000	9.104E-10	0.0000	9.372E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.247E-05	0.0527
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.821E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.095E-05	0.0960
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.571E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.752E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-06	0.0037
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.314E-06	0.0054
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.467E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.091E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-05	0.0248	7.697E-05	0.1805	1.014E-05	0.0238	9.843E-05	0.2308
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.207E-05	0.0987	3.108E-05	0.0729	4.095E-06	0.0096	1.025E-04	0.2405
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.106E-05	0.0963
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.490E-06	0.0199	3.589E-08	0.0001	4.607E-07	0.0011	1.301E-05	0.0305
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.597E-07	0.0006
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.524E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.819E-06	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.761E-06	0.0041
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.610E-05	0.0612
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.217E-06	0.0169
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.116E-05	0.1434	1.081E-04	0.2535	1.469E-05	0.0345	4.264E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 26
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.171E-06	0.0027	2.795E-11	0.0000	0.000E+00	0.0000	3.755E-07	0.0009	3.653E-09	0.0000	1.809E-10	0.0000	1.272E-06	0.0030
C-14	1.865E-18	0.0000	8.726E-17	0.0000	0.000E+00	0.0000	1.387E-13	0.0000	4.221E-14	0.0000	1.449E-14	0.0000	1.058E-16	0.0000
Co-60	1.599E-05	0.0375	2.343E-15	0.0000	0.000E+00	0.0000	1.562E-07	0.0004	7.947E-08	0.0002	8.311E-09	0.0000	6.621E-09	0.0000
Cs-137	4.373E-05	0.1026	3.490E-14	0.0000	0.000E+00	0.0000	1.760E-06	0.0041	1.456E-06	0.0034	4.128E-07	0.0010	1.492E-07	0.0003
H-3	0.000E+00	0.0000	2.378E-13	0.0000	0.000E+00	0.0000	1.032E-12	0.0000	1.602E-13	0.0000	1.171E-13	0.0000	5.141E-16	0.0000
I-129	1.883E-07	0.0004	8.420E-14	0.0000	0.000E+00	0.0000	1.280E-05	0.0300	2.860E-06	0.0067	4.454E-06	0.0104	2.169E-06	0.0051
Ni-63	0.000E+00	0.0000	3.314E-15	0.0000	0.000E+00	0.0000	1.031E-07	0.0002	1.377E-08	0.0000	5.821E-08	0.0001	6.991E-09	0.0000
Np-237	3.456E-05	0.0810	2.220E-11	0.0000	0.000E+00	0.0000	5.314E-06	0.0125	1.693E-07	0.0004	9.326E-10	0.0000	9.011E-07	0.0021
Pu-238	2.442E-09	0.0000	2.952E-11	0.0000	0.000E+00	0.0000	3.611E-07	0.0008	7.024E-09	0.0000	9.192E-11	0.0000	1.223E-06	0.0029
Pu-239	9.019E-09	0.0000	4.383E-11	0.0000	0.000E+00	0.0000	5.229E-07	0.0012	1.017E-08	0.0000	1.260E-10	0.0000	1.772E-06	0.0042
Pu-241	3.278E-08	0.0001	9.022E-13	0.0000	0.000E+00	0.0000	1.169E-08	0.0000	1.256E-10	0.0000	5.340E-12	0.0000	3.961E-08	0.0001
Se-79	3.253E-11	0.0000	1.030E-15	0.0000	0.000E+00	0.0000	1.898E-07	0.0004	4.807E-07	0.0011	4.985E-08	0.0001	6.420E-09	0.0000
Sn-126	2.524E-05	0.0592	2.137E-14	0.0000	0.000E+00	0.0000	1.922E-08	0.0000	1.773E-08	0.0000	2.128E-09	0.0000	2.599E-08	0.0001
Sr-90	3.279E-07	0.0008	1.307E-13	0.0000	0.000E+00	0.0000	3.255E-05	0.0763	6.216E-06	0.0146	1.602E-06	0.0038	3.680E-07	0.0009
Tc-99	2.401E-10	0.0000	1.972E-15	0.0000	0.000E+00	0.0000	3.918E-06	0.0092	9.264E-09	0.0000	9.459E-08	0.0002	2.651E-09	0.0000
U-233	2.636E-07	0.0006	2.314E-11	0.0000	0.000E+00	0.0000	7.322E-07	0.0017	2.275E-08	0.0001	4.806E-08	0.0001	1.011E-06	0.0024
U-234	1.322E-08	0.0000	2.199E-11	0.0000	0.000E+00	0.0000	7.133E-07	0.0017	2.227E-08	0.0001	4.737E-08	0.0001	9.670E-07	0.0023
U-235	2.435E-05	0.0571	1.990E-11	0.0000	0.000E+00	0.0000	7.375E-07	0.0017	2.405E-08	0.0001	4.843E-08	0.0001	9.935E-07	0.0023
U-238	5.008E-06	0.0117	1.869E-11	0.0000	0.000E+00	0.0000	9.003E-07	0.0021	2.811E-08	0.0001	5.983E-08	0.0001	1.221E-06	0.0029
Total	1.509E-04	0.3538	2.086E-10	0.0000	0.000E+00	0.0000	6.117E-05	0.1434	1.142E-05	0.0268	6.887E-06	0.0162	1.214E-05	0.0285

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 27
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.822E-06	0.0066
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.956E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.624E-05	0.0381
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.751E-05	0.1114
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.829E-09	0.0000	6.307E-10	0.0000	9.104E-10	0.0000	9.372E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.247E-05	0.0527
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.821E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.095E-05	0.0960
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.594E-06	0.0037
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.314E-06	0.0054
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.421E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.059E-05	0.0248	7.697E-05	0.1805	1.014E-05	0.0238	9.843E-05	0.2308
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.207E-05	0.0987	3.108E-05	0.0729	4.095E-06	0.0096	1.025E-04	0.2405
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.106E-05	0.0963
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.490E-06	0.0199	3.589E-08	0.0001	4.607E-07	0.0011	1.301E-05	0.0305
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.078E-06	0.0049
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.763E-06	0.0041
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.615E-05	0.0613
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.217E-06	0.0169
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.116E-05	0.1434	1.081E-04	0.2535	1.469E-05	0.0345	4.264E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 28
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 2.163E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.437E-09	1.371E-02	9.372E-05	3.031E-05	1.839E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.223E-02
Am-241	1.124E-05	4.249E+01	4.131E-01	2.047E-02	1.439E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.869E+02
C-14	3.284E-12	4.619E-09	1.407E-09	4.829E-10	3.525E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.513E-09
Co-60	6.604E-07	1.994E+02	1.015E+02	1.061E+01	8.453E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.199E+02
Cs-137	6.887E-06	1.040E+03	8.605E+02	2.439E+02	8.816E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.232E+03
H-3	1.302E-06	3.340E-05	5.189E-06	3.792E-06	1.664E-08	0.000E+00	0.000E+00	4.191E+03	3.814E+02	4.995E+02	5.072E+03
I-129	9.250E-06	6.988E+02	1.561E+02	2.431E+02	1.184E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.216E+03
Ni-63	9.681E-06	1.827E+03	2.442E+02	1.032E+03	1.239E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.227E+03
Np-237	1.123E-05	8.478E+02	2.702E+01	1.473E-01	1.437E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.019E+03
Pa-231	5.194E-09	1.959E-01	3.945E-02	4.502E-05	6.649E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.019E-01
Pb-210	1.977E-12	7.574E-05	2.547E-06	1.056E-06	2.531E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.047E-04
Pu-238	9.603E-06	3.628E+01	7.056E-01	8.741E-03	1.229E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.599E+02
Pu-239	1.138E-05	4.302E+01	8.366E-01	1.036E-02	1.457E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.896E+02
Pu-241	4.022E-06	1.520E+01	2.955E-01	3.661E-03	5.148E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.698E+01
Ra-226	1.034E-11	1.558E-03	4.246E-05	4.537E-05	1.324E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.778E-03
Se-79	1.639E-06	6.203E+02	1.571E+03	1.629E+02	2.098E+01	0.000E+00	0.000E+00	7.817E+04	5.757E+05	7.529E+04	7.315E+05
Sn-126	1.639E-06	1.551E+01	1.432E+01	1.718E+00	2.098E+01	0.000E+00	0.000E+00	7.671E+04	5.743E+04	7.515E+03	1.417E+05
Sr-90	6.752E-06	7.646E+03	1.460E+03	3.764E+02	8.644E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.569E+03
Tc-99	1.639E-06	3.102E+04	7.333E+01	7.487E+02	2.098E+01	0.000E+00	0.000E+00	1.518E+05	6.504E+02	8.292E+03	1.926E+05
Th-229	2.322E-08	8.792E-02	1.721E-03	1.076E-04	2.972E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.870E-01
Th-230	2.215E-09	8.389E-03	1.642E-04	1.027E-05	2.836E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.692E-02
U-233	1.135E-05	1.072E+02	3.345E+00	7.121E+00	1.453E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.630E+02
U-234	1.135E-05	1.072E+02	3.346E+00	7.122E+00	1.453E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.630E+02
U-235	1.135E-05	1.072E+02	3.345E+00	7.121E+00	1.453E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.630E+02
U-238	1.135E-05	1.072E+02	3.345E+00	7.121E+00	1.453E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.630E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 2.163E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/28/2014  10:38  Page  29
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.163E+01 years

0 Water Independent Pathways (Inhalation excludes radon)

0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.299E-08	0.0001	1.111E-13	0.0000	3.236E-09	0.0000	1.409E-11	0.0000	7.161E-12	0.0000	4.364E-09	0.0000
Am-241	1.183E-06	0.0035	2.826E-11	0.0000	3.795E-07	0.0011	3.690E-09	0.0000	1.828E-10	0.0000	1.286E-06	0.0039
C-14	8.527E-26	0.0000	3.990E-24	0.0000	6.342E-21	0.0000	1.932E-21	0.0000	6.630E-22	0.0000	4.839E-24	0.0000
Co-60	3.455E-06	0.0104	5.063E-16	0.0000	3.376E-08	0.0001	1.718E-08	0.0001	1.796E-09	0.0000	1.431E-09	0.0000
Cs-137	3.335E-05	0.1000	2.661E-14	0.0000	1.342E-06	0.0040	1.110E-06	0.0033	3.147E-07	0.0009	1.137E-07	0.0003
H-3	0.000E+00	0.0000	1.042E-18	0.0000	4.524E-18	0.0000	7.029E-19	0.0000	5.136E-19	0.0000	2.253E-21	0.0000
I-129	1.682E-07	0.0005	7.523E-14	0.0000	1.144E-05	0.0343	2.556E-06	0.0077	3.979E-06	0.0119	1.938E-06	0.0058
Ni-63	0.000E+00	0.0000	3.034E-15	0.0000	9.438E-08	0.0003	1.261E-08	0.0000	5.330E-08	0.0002	6.401E-09	0.0000
Np-237	3.427E-05	0.1028	2.201E-11	0.0000	5.269E-06	0.0158	1.679E-07	0.0005	9.156E-10	0.0000	8.934E-07	0.0027
Pa-231	7.337E-09	0.0000	7.185E-14	0.0000	8.041E-09	0.0000	1.623E-09	0.0000	1.839E-12	0.0000	2.728E-09	0.0000
Pb-210	5.864E-13	0.0000	7.580E-17	0.0000	3.224E-10	0.0000	1.061E-11	0.0000	4.448E-12	0.0000	1.086E-10	0.0000
Pu-238	2.225E-09	0.0000	2.691E-11	0.0000	3.291E-07	0.0010	6.401E-09	0.0000	7.929E-11	0.0000	1.115E-06	0.0033
Pu-239	9.009E-09	0.0000	4.378E-11	0.0000	5.224E-07	0.0016	1.016E-08	0.0000	1.259E-10	0.0000	1.770E-06	0.0053
Pu-241	6.098E-11	0.0000	6.980E-14	0.0000	6.944E-10	0.0000	1.350E-11	0.0000	1.673E-13	0.0000	2.353E-09	0.0000
Ra-226	2.609E-09	0.0000	1.562E-16	0.0000	4.289E-10	0.0000	1.178E-11	0.0000	1.255E-11	0.0000	3.640E-11	0.0000
Se-79	1.146E-11	0.0000	3.629E-16	0.0000	6.688E-08	0.0002	1.694E-07	0.0005	1.756E-08	0.0001	2.262E-09	0.0000
Sn-126	8.892E-06	0.0267	7.529E-15	0.0000	6.771E-09	0.0000	6.247E-09	0.0000	7.498E-10	0.0000	9.156E-09	0.0000
Sr-90	2.474E-07	0.0007	9.861E-14	0.0000	2.455E-05	0.0736	4.689E-06	0.0141	1.209E-06	0.0036	2.776E-07	0.0008
Tc-99	8.460E-11	0.0000	6.949E-16	0.0000	1.381E-06	0.0041	3.264E-09	0.0000	3.333E-08	0.0001	9.340E-10	0.0000
Th-229	2.759E-07	0.0008	9.713E-13	0.0000	1.145E-08	0.0000	2.232E-10	0.0000	1.387E-11	0.0000	3.875E-08	0.0001
Th-230	1.884E-11	0.0000	1.374E-14	0.0000	1.819E-10	0.0000	3.545E-12	0.0000	2.204E-13	0.0000	6.156E-10	0.0000
U-233	4.396E-08	0.0001	2.232E-11	0.0000	7.214E-07	0.0022	2.252E-08	0.0001	4.794E-08	0.0001	9.782E-07	0.0029
U-234	1.142E-08	0.0000	2.193E-11	0.0000	7.111E-07	0.0021	2.220E-08	0.0001	4.725E-08	0.0001	9.642E-07	0.0029
U-235	2.425E-05	0.0727	1.972E-11	0.0000	7.269E-07	0.0022	2.269E-08	0.0001	4.830E-08	0.0001	9.857E-07	0.0030
U-238	4.995E-06	0.0150	1.864E-11	0.0000	8.980E-07	0.0027	2.803E-08	0.0001	5.967E-08	0.0002	1.218E-06	0.0037
Total	1.112E-04	0.3336	2.050E-10	0.0000	4.850E-05	0.1455	8.849E-06	0.0265	5.814E-06	0.0174	1.161E-05	0.0348

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 30
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.163E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.061E-08	0.0002
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.852E-06	0.0086
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.947E-21	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.509E-06	0.0105
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-05	0.1087
H-3	0.000E+00	0.0000	0.000E+00	0.0000	5.724E-10	0.0000	5.209E-11	0.0000	6.822E-11	0.0000	6.927E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.008E-05	0.0602
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.667E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.061E-05	0.1218
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-08	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.466E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-06	0.0044
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.312E-06	0.0069
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.122E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.099E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	8.418E-06	0.0252	6.200E-05	0.1860	8.109E-06	0.0243	7.878E-05	0.2363
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	3.344E-05	0.1003	2.503E-05	0.0751	3.276E-06	0.0098	7.066E-05	0.2119
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.098E-05	0.0929
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	6.751E-06	0.0202	2.891E-08	0.0001	3.686E-07	0.0011	8.567E-06	0.0257
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.264E-07	0.0010
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.200E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.814E-06	0.0054
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.756E-06	0.0053
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.604E-05	0.0781
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.199E-06	0.0216
Total	0.000E+00	0.0000	0.000E+00	0.0000	4.861E-05	0.1458	8.706E-05	0.2611	1.175E-05	0.0353	3.334E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 2.163E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 31
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.163E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.149E-06	0.0034	2.742E-11	0.0000	0.000E+00	0.0000	3.683E-07	0.0011	3.583E-09	0.0000	1.774E-10	0.0000	1.247E-06	0.0037
C-14	8.527E-26	0.0000	3.990E-24	0.0000	0.000E+00	0.0000	6.342E-21	0.0000	1.932E-21	0.0000	6.630E-22	0.0000	4.839E-24	0.0000
Co-60	3.455E-06	0.0104	5.063E-16	0.0000	0.000E+00	0.0000	3.376E-08	0.0001	1.718E-08	0.0001	1.796E-09	0.0000	1.431E-09	0.0000
Cs-137	3.335E-05	0.1000	2.661E-14	0.0000	0.000E+00	0.0000	1.342E-06	0.0040	1.110E-06	0.0033	3.147E-07	0.0009	1.137E-07	0.0003
H-3	0.000E+00	0.0000	1.042E-18	0.0000	0.000E+00	0.0000	4.524E-18	0.0000	7.029E-19	0.0000	5.136E-19	0.0000	2.253E-21	0.0000
I-129	1.682E-07	0.0005	7.523E-14	0.0000	0.000E+00	0.0000	1.144E-05	0.0343	2.556E-06	0.0077	3.979E-06	0.0119	1.938E-06	0.0058
Ni-63	0.000E+00	0.0000	3.034E-15	0.0000	0.000E+00	0.0000	9.438E-08	0.0003	1.261E-08	0.0000	5.330E-08	0.0002	6.401E-09	0.0000
Np-237	3.427E-05	0.1028	2.202E-11	0.0000	0.000E+00	0.0000	5.269E-06	0.0158	1.679E-07	0.0005	9.273E-10	0.0000	8.937E-07	0.0027
Pu-238	2.227E-09	0.0000	2.691E-11	0.0000	0.000E+00	0.0000	3.292E-07	0.0010	6.404E-09	0.0000	8.529E-11	0.0000	1.115E-06	0.0033
Pu-239	9.011E-09	0.0000	4.378E-11	0.0000	0.000E+00	0.0000	5.224E-07	0.0016	1.016E-08	0.0000	1.259E-10	0.0000	1.770E-06	0.0053
Pu-241	3.526E-08	0.0001	9.100E-13	0.0000	0.000E+00	0.0000	1.198E-08	0.0000	1.233E-10	0.0000	5.604E-12	0.0000	4.058E-08	0.0001
Se-79	1.146E-11	0.0000	3.629E-16	0.0000	0.000E+00	0.0000	6.688E-08	0.0002	1.694E-07	0.0005	1.756E-08	0.0001	2.262E-09	0.0000
Sn-126	8.892E-06	0.0267	7.529E-15	0.0000	0.000E+00	0.0000	6.771E-09	0.0000	6.247E-09	0.0000	7.498E-10	0.0000	9.156E-09	0.0000
Sr-90	2.474E-07	0.0007	9.861E-14	0.0000	0.000E+00	0.0000	2.455E-05	0.0736	4.689E-06	0.0141	1.209E-06	0.0036	2.776E-07	0.0008
Tc-99	8.460E-11	0.0000	6.949E-16	0.0000	0.000E+00	0.0000	1.381E-06	0.0041	3.264E-09	0.0000	3.333E-08	0.0001	9.340E-10	0.0000
U-233	3.198E-07	0.0010	2.328E-11	0.0000	0.000E+00	0.0000	7.327E-07	0.0022	2.274E-08	0.0001	4.794E-08	0.0001	1.017E-06	0.0030
U-234	1.405E-08	0.0000	2.194E-11	0.0000	0.000E+00	0.0000	7.118E-07	0.0021	2.222E-08	0.0001	4.726E-08	0.0001	9.647E-07	0.0029
U-235	2.430E-05	0.0729	1.990E-11	0.0000	0.000E+00	0.0000	7.382E-07	0.0022	2.433E-08	0.0001	4.831E-08	0.0001	9.928E-07	0.0030
U-238	4.995E-06	0.0150	1.864E-11	0.0000	0.000E+00	0.0000	8.981E-07	0.0027	2.804E-08	0.0001	5.968E-08	0.0002	1.218E-06	0.0037
Total	1.112E-04	0.3336	2.050E-10	0.0000	0.000E+00	0.0000	4.850E-05	0.1455	8.849E-06	0.0265	5.814E-06	0.0174	1.161E-05	0.0348

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 32
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.163E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.768E-06	0.0083
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.947E-21	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.509E-06	0.0105
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.623E-05	0.1087
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.724E-10	0.0000	5.209E-11	0.0000	6.822E-11	0.0000	6.927E-10	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.008E-05	0.0602
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.667E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.061E-05	0.1218
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.453E-06	0.0044
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.312E-06	0.0069
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.795E-08	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.418E-06	0.0252	6.200E-05	0.1860	8.109E-06	0.0243	7.878E-05	0.2363
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.344E-05	0.1003	2.503E-05	0.0751	3.276E-06	0.0098	7.066E-05	0.2119
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.098E-05	0.0929
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.751E-06	0.0202	2.891E-08	0.0001	3.686E-07	0.0011	8.567E-06	0.0257
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.140E-06	0.0064
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.760E-06	0.0053
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.611E-05	0.0783
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.199E-06	0.0216
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.861E-05	0.1458	8.706E-05	0.2611	1.175E-05	0.0353	3.334E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 33
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.552E-09	2.429E-02	1.396E-04	5.373E-05	3.267E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.715E-02
Am-241	1.113E-05	4.207E+01	4.091E-01	2.027E-02	1.425E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.850E+02
C-14	1.631E-17	2.295E-14	6.996E-15	2.400E-15	1.751E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.236E-14
Co-60	2.193E-07	6.621E+01	3.369E+01	3.523E+00	2.807E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.062E+02
Cs-137	5.666E-06	8.555E+02	7.079E+02	2.007E+02	7.253E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.837E+03
H-3	1.759E-10	4.511E-09	7.012E-10	5.123E-10	2.247E-12	0.000E+00	0.000E+00	6.093E-01	5.546E-02	7.262E-02	7.374E-01
I-129	8.529E-06	6.444E+02	1.440E+02	2.242E+02	1.092E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.122E+03
Ni-63	9.085E-06	1.715E+03	2.291E+02	9.683E+02	1.163E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.028E+03
Np-237	1.116E-05	8.427E+02	2.686E+01	1.464E-01	1.429E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.013E+03
Pa-231	7.190E-09	2.712E-01	5.468E-02	6.221E-05	9.204E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.180E-01
Pb-210	4.969E-12	1.897E-04	6.324E-06	2.634E-06	6.361E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.623E-04
Pu-238	8.984E-06	3.395E+01	6.602E-01	8.178E-03	1.150E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.496E+02
Pu-239	1.138E-05	4.299E+01	8.360E-01	1.036E-02	1.456E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.895E+02
Pu-241	2.687E-06	1.015E+01	1.974E-01	2.446E-03	3.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.475E+01
Ra-226	1.985E-11	2.992E-03	8.183E-05	8.731E-05	2.541E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.415E-03
Se-79	7.735E-07	2.928E+02	7.414E+02	7.689E+01	9.901E+00	0.000E+00	0.000E+00	3.686E+04	2.715E+05	3.550E+04	3.450E+05
Sn-126	7.736E-07	7.323E+00	6.757E+00	8.109E-01	9.903E+00	0.000E+00	0.000E+00	3.617E+04	2.708E+04	3.544E+03	6.682E+04
Sr-90	5.513E-06	6.242E+03	1.192E+03	3.073E+02	7.057E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.812E+03
Tc-99	7.737E-07	1.464E+04	3.462E+01	3.534E+02	9.904E+00	0.000E+00	0.000E+00	7.161E+04	3.067E+02	3.910E+03	9.086E+04
Th-229	3.216E-08	1.217E-01	2.378E-03	1.483E-04	4.117E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.359E-01
Th-230	3.070E-09	1.162E-02	2.270E-04	1.415E-05	3.930E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.115E-02
U-233	1.133E-05	1.070E+02	3.339E+00	7.108E+00	1.451E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.625E+02
U-234	1.133E-05	1.070E+02	3.340E+00	7.109E+00	1.451E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.625E+02
U-235	1.133E-05	1.070E+02	3.339E+00	7.108E+00	1.451E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.625E+02
U-238	1.133E-05	1.070E+02	3.339E+00	7.108E+00	1.451E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.625E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 34
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	5.228E-08	0.0002	1.352E-13	0.0000	3.934E-09	0.0000	1.656E-11	0.0000	8.707E-12	0.0000	5.308E-09	0.0000
Am-241	1.168E-06	0.0050	2.790E-11	0.0000	3.747E-07	0.0016	3.644E-09	0.0000	1.805E-10	0.0000	1.269E-06	0.0054
C-14	0.000E+00	0.0000	1.905E-29	0.0000	3.139E-26	0.0000	9.570E-27	0.0000	3.282E-27	0.0000	2.310E-29	0.0000
Co-60	1.147E-06	0.0049	1.681E-16	0.0000	1.121E-08	0.0000	5.703E-09	0.0000	5.964E-10	0.0000	4.751E-10	0.0000
Cs-137	2.743E-05	0.1175	2.189E-14	0.0000	1.104E-06	0.0047	9.133E-07	0.0039	2.589E-07	0.0011	9.358E-08	0.0004
H-3	0.000E+00	0.0000	1.403E-22	0.0000	6.092E-22	0.0000	9.469E-23	0.0000	6.918E-23	0.0000	3.034E-25	0.0000
I-129	1.551E-07	0.0007	6.937E-14	0.0000	1.055E-05	0.0452	2.357E-06	0.0101	3.669E-06	0.0157	1.787E-06	0.0077
Ni-63	0.000E+00	0.0000	2.848E-15	0.0000	8.858E-08	0.0004	1.184E-08	0.0001	5.002E-08	0.0002	6.008E-09	0.0000
Np-237	3.407E-05	0.1459	2.188E-11	0.0000	5.238E-06	0.0224	1.669E-07	0.0007	9.101E-10	0.0000	8.881E-07	0.0038
Pa-231	8.407E-09	0.0000	8.232E-14	0.0000	9.214E-09	0.0000	1.860E-09	0.0000	2.107E-12	0.0000	3.126E-09	0.0000
Pb-210	7.954E-13	0.0000	1.028E-16	0.0000	4.372E-10	0.0000	1.437E-11	0.0000	6.029E-12	0.0000	1.474E-10	0.0000
Pu-238	2.082E-09	0.0000	2.517E-11	0.0000	3.079E-07	0.0013	5.989E-09	0.0000	7.418E-11	0.0000	1.043E-06	0.0045
Pu-239	9.003E-09	0.0000	4.375E-11	0.0000	5.221E-07	0.0022	1.015E-08	0.0000	1.258E-10	0.0000	1.769E-06	0.0076
Pu-241	4.074E-11	0.0000	4.663E-14	0.0000	4.639E-10	0.0000	9.022E-12	0.0000	1.118E-13	0.0000	1.572E-09	0.0000
Ra-226	3.338E-09	0.0000	1.998E-16	0.0000	5.487E-10	0.0000	1.508E-11	0.0000	1.606E-11	0.0000	4.656E-11	0.0000
Se-79	5.410E-12	0.0000	1.713E-16	0.0000	3.157E-08	0.0001	7.995E-08	0.0003	8.291E-09	0.0000	1.068E-09	0.0000
Sn-126	4.197E-06	0.0180	3.554E-15	0.0000	3.196E-09	0.0000	2.949E-09	0.0000	3.539E-10	0.0000	4.322E-09	0.0000
Sr-90	2.019E-07	0.0009	8.051E-14	0.0000	2.005E-05	0.0859	3.828E-06	0.0164	9.869E-07	0.0042	2.266E-07	0.0010
Tc-99	3.993E-11	0.0000	3.280E-16	0.0000	6.517E-07	0.0028	1.541E-09	0.0000	1.573E-08	0.0001	4.409E-10	0.0000
Th-229	3.164E-07	0.0014	1.114E-12	0.0000	1.312E-08	0.0001	2.558E-10	0.0000	1.589E-11	0.0000	4.443E-08	0.0002
Th-230	2.160E-11	0.0000	1.576E-14	0.0000	2.085E-10	0.0000	4.064E-12	0.0000	2.525E-13	0.0000	7.060E-10	0.0000
U-233	4.388E-08	0.0002	2.228E-11	0.0000	7.201E-07	0.0031	2.248E-08	0.0001	4.785E-08	0.0002	9.765E-07	0.0042
U-234	1.140E-08	0.0000	2.189E-11	0.0000	7.098E-07	0.0030	2.216E-08	0.0001	4.717E-08	0.0002	9.625E-07	0.0041
U-235	2.421E-05	0.1037	1.968E-11	0.0000	7.256E-07	0.0031	2.265E-08	0.0001	4.822E-08	0.0002	9.839E-07	0.0042
U-238	4.986E-06	0.0214	1.860E-11	0.0000	8.963E-07	0.0038	2.798E-08	0.0001	5.956E-08	0.0003	1.215E-06	0.0052
Total	9.801E-05	0.4198	2.027E-10	0.0000	4.201E-05	0.1799	7.484E-06	0.0321	5.194E-06	0.0222	1.128E-05	0.0483

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 35
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.155E-08	0.0003
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.816E-06	0.0121
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.165E-06	0.0050
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.980E-05	0.1276
H-3	0.000E+00	0.0000	0.000E+00	0.0000	8.296E-14	0.0000	7.550E-15	0.0000	9.888E-15	0.0000	1.004E-13	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-05	0.0793
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.564E-07	0.0007
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-05	0.1729
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.261E-08	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.057E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0058
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.310E-06	0.0099
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.086E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.964E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	3.970E-06	0.0170	2.924E-05	0.1252	3.824E-06	0.0164	3.715E-05	0.1591
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-05	0.0675	1.180E-05	0.0506	1.545E-06	0.0066	3.332E-05	0.1427
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-05	0.1083
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	3.184E-06	0.0136	1.364E-08	0.0001	1.738E-07	0.0007	4.041E-06	0.0173
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.742E-07	0.0016
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.404E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-06	0.0078
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.753E-06	0.0075
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.599E-05	0.1113
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.186E-06	0.0308
Total	0.000E+00	0.0000	0.000E+00	0.0000	2.292E-05	0.0982	4.105E-05	0.1758	5.542E-06	0.0237	2.335E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 36
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.133E-06	0.0049	2.704E-11	0.0000	0.000E+00	0.0000	3.632E-07	0.0016	3.534E-09	0.0000	1.750E-10	0.0000	1.230E-06	0.0053
C-14	0.000E+00	0.0000	1.905E-29	0.0000	0.000E+00	0.0000	3.139E-26	0.0000	9.570E-27	0.0000	3.282E-27	0.0000	2.310E-29	0.0000
Co-60	1.147E-06	0.0049	1.681E-16	0.0000	0.000E+00	0.0000	1.121E-08	0.0000	5.703E-09	0.0000	5.964E-10	0.0000	4.751E-10	0.0000
Cs-137	2.743E-05	0.1175	2.189E-14	0.0000	0.000E+00	0.0000	1.104E-06	0.0047	9.133E-07	0.0039	2.589E-07	0.0011	9.358E-08	0.0004
H-3	0.000E+00	0.0000	1.403E-22	0.0000	0.000E+00	0.0000	6.092E-22	0.0000	9.469E-23	0.0000	6.918E-23	0.0000	3.034E-25	0.0000
I-129	1.551E-07	0.0007	6.937E-14	0.0000	0.000E+00	0.0000	1.055E-05	0.0452	2.357E-06	0.0101	3.669E-06	0.0157	1.787E-06	0.0077
Ni-63	0.000E+00	0.0000	2.848E-15	0.0000	0.000E+00	0.0000	8.858E-08	0.0004	1.184E-08	0.0001	5.002E-08	0.0002	6.008E-09	0.0000
Np-237	3.407E-05	0.1459	2.189E-11	0.0000	0.000E+00	0.0000	5.238E-06	0.0224	1.669E-07	0.0007	9.235E-10	0.0000	8.884E-07	0.0038
Pu-238	2.084E-09	0.0000	2.518E-11	0.0000	0.000E+00	0.0000	3.080E-07	0.0013	5.992E-09	0.0000	8.088E-11	0.0000	1.043E-06	0.0045
Pu-239	9.005E-09	0.0000	4.375E-11	0.0000	0.000E+00	0.0000	5.221E-07	0.0022	1.015E-08	0.0000	1.258E-10	0.0000	1.769E-06	0.0076
Pu-241	3.615E-08	0.0002	9.086E-13	0.0000	0.000E+00	0.0000	1.204E-08	0.0001	1.217E-10	0.0000	5.690E-12	0.0000	4.079E-08	0.0002
Se-79	5.410E-12	0.0000	1.713E-16	0.0000	0.000E+00	0.0000	3.157E-08	0.0001	7.995E-08	0.0003	8.291E-09	0.0000	1.068E-09	0.0000
Sn-126	4.197E-06	0.0180	3.554E-15	0.0000	0.000E+00	0.0000	3.196E-09	0.0000	2.949E-09	0.0000	3.539E-10	0.0000	4.322E-09	0.0000
Sr-90	2.019E-07	0.0009	8.051E-14	0.0000	0.000E+00	0.0000	2.005E-05	0.0859	3.828E-06	0.0164	9.869E-07	0.0042	2.266E-07	0.0010
Tc-99	3.993E-11	0.0000	3.280E-16	0.0000	0.000E+00	0.0000	6.517E-07	0.0028	1.541E-09	0.0000	1.573E-08	0.0001	4.409E-10	0.0000
U-233	3.602E-07	0.0015	2.339E-11	0.0000	0.000E+00	0.0000	7.330E-07	0.0031	2.273E-08	0.0001	4.785E-08	0.0002	1.021E-06	0.0044
U-234	1.476E-08	0.0001	2.190E-11	0.0000	0.000E+00	0.0000	7.108E-07	0.0030	2.218E-08	0.0001	4.717E-08	0.0002	9.631E-07	0.0041
U-235	2.427E-05	0.1039	1.990E-11	0.0000	0.000E+00	0.0000	7.388E-07	0.0032	2.453E-08	0.0001	4.823E-08	0.0002	9.924E-07	0.0042
U-238	4.986E-06	0.0214	1.861E-11	0.0000	0.000E+00	0.0000	8.965E-07	0.0038	2.798E-08	0.0001	5.957E-08	0.0003	1.216E-06	0.0052
Total	9.801E-05	0.4198	2.027E-10	0.0000	0.000E+00	0.0000	4.201E-05	0.1799	7.484E-06	0.0321	5.194E-06	0.0222	1.128E-05	0.0483

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 37
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.730E-06	0.0117
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.165E-06	0.0050
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.980E-05	0.1276
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.296E-14	0.0000	7.550E-15	0.0000	9.888E-15	0.0000	1.004E-13	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.852E-05	0.0793
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.564E-07	0.0007
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.036E-05	0.1729
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.360E-06	0.0058
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.310E-06	0.0099
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.911E-08	0.0004
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.970E-06	0.0170	2.924E-05	0.1252	3.824E-06	0.0164	3.715E-05	0.1591
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.577E-05	0.0675	1.180E-05	0.0506	1.545E-06	0.0066	3.332E-05	0.1427
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-05	0.1083
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.184E-06	0.0136	1.364E-08	0.0001	1.738E-07	0.0007	4.041E-06	0.0173
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.184E-06	0.0094
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.758E-06	0.0075
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.607E-05	0.1117
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.186E-06	0.0308
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.292E-05	0.0982	4.105E-05	0.1758	5.542E-06	0.0237	2.335E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 38
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.639E-08	1.553E-01	5.978E-04	3.439E-04	2.098E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.660E-01
Am-241	9.993E-06	3.776E+01	3.671E-01	1.819E-02	1.279E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.661E+02
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	2.171E-11	6.555E-03	3.336E-03	3.488E-04	2.779E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.052E-02
Cs-137	1.107E-06	1.672E+02	1.383E+02	3.922E+01	1.417E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.589E+02
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	4.330E-06	3.271E+02	7.309E+01	1.138E+02	5.542E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.694E+02
Ni-63	5.344E-06	1.009E+03	1.348E+02	5.696E+02	6.841E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.781E+03
Np-237	1.062E-05	8.014E+02	2.554E+01	1.393E-01	1.359E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.630E+02
Pa-231	2.359E-08	8.903E-01	1.798E-01	2.034E-04	3.020E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.372E+00
Pb-210	1.203E-10	4.565E-03	1.497E-04	6.289E-05	1.540E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.317E-03
Pu-238	5.148E-06	1.945E+01	3.783E-01	4.686E-03	6.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.574E+01
Pu-239	1.131E-05	4.274E+01	8.312E-01	1.030E-02	1.448E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.884E+02
Pu-241	9.210E-08	3.480E-01	6.768E-03	8.383E-05	1.179E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.534E+00
Ra-226	2.165E-10	3.266E-02	8.987E-04	9.564E-04	2.771E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.729E-02
Se-79	1.451E-09	5.491E-01	1.391E+00	1.442E-01	1.857E-02	0.000E+00	0.000E+00	6.859E+01	5.051E+02	6.606E+01	6.419E+02
Sn-126	1.451E-09	1.374E-02	1.268E-02	1.521E-03	1.858E-02	0.000E+00	0.000E+00	6.733E+01	5.040E+01	6.596E+00	1.244E+02
Sr-90	1.011E-06	1.144E+03	2.185E+02	5.634E+01	1.294E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.432E+03
Tc-99	1.452E-09	2.748E+01	6.496E-02	6.632E-01	1.859E-02	0.000E+00	0.000E+00	1.333E+02	5.710E-01	7.280E+00	1.694E+02
Th-229	1.060E-07	4.009E-01	7.807E-03	4.845E-04	1.357E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.767E+00
Th-230	1.015E-08	3.838E-02	7.475E-04	4.639E-05	1.300E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.691E-01
U-233	1.116E-05	1.054E+02	3.289E+00	7.001E+00	1.429E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.585E+02
U-234	1.116E-05	1.054E+02	3.290E+00	7.003E+00	1.429E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.586E+02
U-235	1.116E-05	1.054E+02	3.289E+00	7.001E+00	1.429E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.585E+02
U-238	1.116E-05	1.054E+02	3.289E+00	7.001E+00	1.429E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.585E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 39
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.393E-07	0.0014	3.602E-13	0.0000	1.047E-08	0.0001	3.835E-11	0.0000	2.318E-11	0.0000	1.414E-08	0.0001
Am-241	1.043E-06	0.0103	2.490E-11	0.0000	3.345E-07	0.0033	3.252E-09	0.0000	1.611E-10	0.0000	1.133E-06	0.0112
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.137E-10	0.0000	1.665E-20	0.0000	1.110E-12	0.0000	5.650E-13	0.0000	5.909E-14	0.0000	4.707E-14	0.0000
Cs-137	5.361E-06	0.0530	4.278E-15	0.0000	2.157E-07	0.0021	1.785E-07	0.0018	5.060E-08	0.0005	1.829E-08	0.0002
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.875E-08	0.0008	3.522E-14	0.0000	5.354E-06	0.0529	1.196E-06	0.0118	1.863E-06	0.0184	9.072E-07	0.0090
Ni-63	0.000E+00	0.0000	1.675E-15	0.0000	5.210E-08	0.0005	6.963E-09	0.0001	2.942E-08	0.0003	3.534E-09	0.0000
Np-237	3.240E-05	0.3200	2.081E-11	0.0000	4.981E-06	0.0492	1.587E-07	0.0016	8.655E-10	0.0000	8.445E-07	0.0083
Pa-231	1.720E-08	0.0002	1.684E-13	0.0000	1.885E-08	0.0002	3.809E-09	0.0000	4.305E-12	0.0000	6.394E-09	0.0001
Pb-210	4.283E-12	0.0000	5.537E-16	0.0000	2.350E-09	0.0000	7.694E-11	0.0000	3.235E-11	0.0000	7.935E-10	0.0000
Pu-238	1.193E-09	0.0000	1.443E-11	0.0000	1.765E-07	0.0017	3.432E-09	0.0000	4.251E-11	0.0000	5.978E-07	0.0059
Pu-239	8.951E-09	0.0001	4.350E-11	0.0000	5.191E-07	0.0051	1.009E-08	0.0001	1.250E-10	0.0000	1.758E-06	0.0174
Pu-241	1.396E-12	0.0000	1.598E-15	0.0000	1.590E-11	0.0000	3.093E-13	0.0000	3.831E-15	0.0000	5.387E-11	0.0000
Ra-226	1.319E-08	0.0001	7.895E-16	0.0000	2.170E-09	0.0000	5.973E-11	0.0000	6.355E-11	0.0000	1.840E-10	0.0000
Se-79	1.015E-14	0.0000	3.213E-19	0.0000	5.922E-11	0.0000	1.500E-10	0.0000	1.555E-11	0.0000	2.003E-12	0.0000
Sn-126	7.876E-09	0.0001	6.668E-18	0.0000	5.997E-12	0.0000	5.533E-12	0.0000	6.641E-13	0.0000	8.109E-12	0.0000
Sr-90	3.702E-08	0.0004	1.476E-14	0.0000	3.675E-06	0.0363	7.018E-07	0.0069	1.809E-07	0.0018	4.154E-08	0.0004
Tc-99	7.495E-14	0.0000	6.157E-19	0.0000	1.223E-09	0.0000	2.892E-12	0.0000	2.953E-11	0.0000	8.274E-13	0.0000
Th-229	6.503E-07	0.0064	2.289E-12	0.0000	2.696E-08	0.0003	5.249E-10	0.0000	3.256E-11	0.0000	9.132E-08	0.0009
Th-230	4.453E-11	0.0000	3.248E-14	0.0000	4.297E-10	0.0000	8.366E-12	0.0000	5.189E-13	0.0000	1.455E-09	0.0000
U-233	4.322E-08	0.0004	2.194E-11	0.0000	7.093E-07	0.0070	2.214E-08	0.0002	4.713E-08	0.0005	9.618E-07	0.0095
U-234	1.123E-08	0.0001	2.156E-11	0.0000	6.992E-07	0.0069	2.183E-08	0.0002	4.646E-08	0.0005	9.481E-07	0.0094
U-235	2.384E-05	0.2355	1.939E-11	0.0000	7.147E-07	0.0071	2.231E-08	0.0002	4.749E-08	0.0005	9.691E-07	0.0096
U-238	4.911E-06	0.0485	1.832E-11	0.0000	8.828E-07	0.0087	2.756E-08	0.0003	5.866E-08	0.0006	1.197E-06	0.0118
Total	6.857E-05	0.6772	1.878E-10	0.0000	1.838E-05	0.1815	2.358E-06	0.0233	2.325E-06	0.0230	9.495E-06	0.0938

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 40
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.640E-07	0.0016
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.514E-06	0.0248
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-10	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.824E-06	0.0575
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.399E-06	0.0928
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.202E-08	0.0009
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.838E-05	0.3791
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.626E-08	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.257E-09	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.790E-07	0.0077
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.297E-06	0.0227
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.149E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.567E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	7.387E-09	0.0001	5.441E-08	0.0005	7.115E-09	0.0001	6.913E-08	0.0007
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-08	0.0003	2.197E-08	0.0002	2.875E-09	0.0000	6.209E-08	0.0006
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.636E-06	0.0458
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	5.927E-09	0.0001	2.539E-11	0.0000	3.237E-10	0.0000	7.533E-09	0.0001
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.691E-07	0.0076
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.939E-09	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.784E-06	0.0176
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.727E-06	0.0171
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.560E-05	0.2528
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.077E-06	0.0699
Total	0.000E+00	0.0000	0.000E+00	0.0000	4.266E-08	0.0004	7.640E-08	0.0008	1.031E-08	0.0001	1.013E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 41
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.010E-06	0.0100	2.408E-11	0.0000	0.000E+00	0.0000	3.236E-07	0.0032	3.151E-09	0.0000	1.558E-10	0.0000	1.095E-06	0.0108
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	1.137E-10	0.0000	1.665E-20	0.0000	0.000E+00	0.0000	1.110E-12	0.0000	5.650E-13	0.0000	5.909E-14	0.0000	4.707E-14	0.0000
Cs-137	5.361E-06	0.0530	4.278E-15	0.0000	0.000E+00	0.0000	2.157E-07	0.0021	1.785E-07	0.0018	5.060E-08	0.0005	1.829E-08	0.0002
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	7.875E-08	0.0008	3.522E-14	0.0000	0.000E+00	0.0000	5.354E-06	0.0529	1.196E-06	0.0118	1.863E-06	0.0184	9.072E-07	0.0090
Ni-63	0.000E+00	0.0000	1.675E-15	0.0000	0.000E+00	0.0000	5.210E-08	0.0005	6.963E-09	0.0001	2.942E-08	0.0003	3.534E-09	0.0000
Np-237	3.240E-05	0.3200	2.082E-11	0.0000	0.000E+00	0.0000	4.981E-06	0.0492	1.587E-07	0.0016	8.924E-10	0.0000	8.451E-07	0.0083
Pu-238	1.197E-09	0.0000	1.443E-11	0.0000	0.000E+00	0.0000	1.766E-07	0.0017	3.437E-09	0.0000	5.347E-11	0.0000	5.981E-07	0.0059
Pu-239	8.954E-09	0.0001	4.350E-11	0.0000	0.000E+00	0.0000	5.191E-07	0.0051	1.009E-08	0.0001	1.250E-10	0.0000	1.758E-06	0.0174
Pu-241	3.469E-08	0.0003	8.290E-13	0.0000	0.000E+00	0.0000	1.113E-08	0.0001	1.085E-10	0.0000	5.359E-12	0.0000	3.770E-08	0.0004
Se-79	1.015E-14	0.0000	3.213E-19	0.0000	0.000E+00	0.0000	5.922E-11	0.0000	1.500E-10	0.0000	1.555E-11	0.0000	2.003E-12	0.0000
Sn-126	7.876E-09	0.0001	6.668E-18	0.0000	0.000E+00	0.0000	5.997E-12	0.0000	5.533E-12	0.0000	6.641E-13	0.0000	8.109E-12	0.0000
Sr-90	3.702E-08	0.0004	1.476E-14	0.0000	0.000E+00	0.0000	3.675E-06	0.0363	7.018E-07	0.0069	1.809E-07	0.0018	4.154E-08	0.0004
Tc-99	7.495E-14	0.0000	6.157E-19	0.0000	0.000E+00	0.0000	1.223E-09	0.0000	2.892E-12	0.0000	2.953E-11	0.0000	8.274E-13	0.0000
U-233	6.933E-07	0.0068	2.422E-11	0.0000	0.000E+00	0.0000	7.358E-07	0.0073	2.265E-08	0.0002	4.714E-08	0.0005	1.053E-06	0.0104
U-234	2.446E-08	0.0002	2.158E-11	0.0000	0.000E+00	0.0000	7.037E-07	0.0070	2.196E-08	0.0002	4.653E-08	0.0005	9.500E-07	0.0094
U-235	2.400E-05	0.2370	1.991E-11	0.0000	0.000E+00	0.0000	7.440E-07	0.0073	2.616E-08	0.0003	4.752E-08	0.0005	9.897E-07	0.0098
U-238	4.911E-06	0.0485	1.833E-11	0.0000	0.000E+00	0.0000	8.831E-07	0.0087	2.757E-08	0.0003	5.868E-08	0.0006	1.197E-06	0.0118
Total	6.857E-05	0.6772	1.878E-10	0.0000	0.000E+00	0.0000	1.838E-05	0.1815	2.358E-06	0.0233	2.325E-06	0.0230	9.495E-06	0.0938

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 42
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.432E-06	0.0240
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.154E-10	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.824E-06	0.0575
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.399E-06	0.0928
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.202E-08	0.0009
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.838E-05	0.3791
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.794E-07	0.0077
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.297E-06	0.0227
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.364E-08	0.0008
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.387E-09	0.0001	5.441E-08	0.0005	7.115E-09	0.0001	6.913E-08	0.0007
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.935E-08	0.0003	2.197E-08	0.0002	2.875E-09	0.0000	6.209E-08	0.0006
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.636E-06	0.0458
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.927E-09	0.0001	2.539E-11	0.0000	3.237E-10	0.0000	7.533E-09	0.0001
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.551E-06	0.0252
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.747E-06	0.0173
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.581E-05	0.2549
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.078E-06	0.0699
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.266E-08	0.0004	7.640E-08	0.0008	1.031E-08	0.0001	1.013E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 43
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	6.002E-08	5.685E-01	1.941E-03	1.259E-03	7.684E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.340E+00
Am-241	7.175E-06	2.711E+01	2.636E-01	1.306E-02	9.184E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.192E+02
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	7.865E-23	2.375E-14	1.208E-14	1.264E-15	1.007E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.811E-14
Cs-137	1.044E-08	1.576E+00	1.304E+00	3.697E-01	1.336E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.383E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	6.239E-07	4.714E+01	1.053E+01	1.640E+01	7.987E+00	0.000E+00	0.000E+00	3.087E+03	1.594E+03	2.997E+03	7.760E+03
Ni-63	1.173E-06	2.214E+02	2.959E+01	1.251E+02	1.502E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.911E+02
Np-237	9.195E-06	6.942E+02	2.212E+01	1.206E-01	1.177E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.341E+02
Pa-231	6.763E-08	2.553E+00	5.159E-01	5.825E-04	8.657E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.935E+00
Pb-210	1.499E-09	5.679E-02	1.855E-03	7.807E-04	1.919E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.861E-02
Pu-238	1.049E-06	3.964E+00	7.708E-02	9.548E-04	1.343E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.747E+01
Pu-239	1.112E-05	4.204E+01	8.175E-01	1.013E-02	1.424E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.853E+02
Pu-241	6.006E-12	2.269E-05	4.413E-07	5.467E-09	7.688E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.000E-04
Ra-226	1.847E-09	2.788E-01	7.682E-03	8.169E-03	2.364E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.182E-01
Se-79	2.347E-17	8.885E-09	2.250E-08	2.333E-09	3.005E-10	0.000E+00	0.000E+00	1.083E-06	7.978E-06	1.043E-06	1.014E-05
Sn-126	2.350E-17	2.225E-10	2.053E-10	2.463E-11	3.008E-10	0.000E+00	0.000E+00	1.064E-06	7.967E-07	1.042E-07	1.966E-06
Sr-90	7.935E-09	8.985E+00	1.716E+00	4.423E-01	1.016E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.124E+01
Tc-99	2.353E-17	4.452E-07	1.053E-09	1.075E-08	3.012E-10	0.000E+00	0.000E+00	2.109E-06	9.032E-09	1.151E-07	2.690E-06
Th-229	3.084E-07	1.165E+00	2.268E-02	1.405E-03	3.948E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.137E+00
Th-230	2.979E-08	1.126E-01	2.190E-03	1.357E-04	3.813E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.962E-01
U-233	1.069E-05	1.009E+02	3.149E+00	6.704E+00	1.368E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.475E+02
U-234	1.069E-05	1.009E+02	3.151E+00	6.707E+00	1.369E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.476E+02
U-235	1.069E-05	1.009E+02	3.150E+00	6.704E+00	1.368E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.476E+02
U-238	1.069E-05	1.009E+02	3.150E+00	6.704E+00	1.368E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.476E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 44
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.877E-07	0.0019	1.002E-12	0.0000	2.913E-08	0.0001	9.887E-11	0.0000	6.448E-11	0.0000	3.937E-08	0.0002
Am-241	7.486E-07	0.0037	1.788E-11	0.0000	2.401E-07	0.0012	2.335E-09	0.0000	1.157E-10	0.0000	8.134E-07	0.0040
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	4.118E-22	0.0000	0.000E+00	0.0000	4.023E-24	0.0000	2.047E-24	0.0000	2.141E-25	0.0000	1.705E-25	0.0000
Cs-137	5.053E-08	0.0003	4.033E-17	0.0000	2.033E-09	0.0000	1.683E-09	0.0000	4.770E-10	0.0000	1.724E-10	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.135E-08	0.0001	5.075E-15	0.0000	7.716E-07	0.0038	1.724E-07	0.0009	2.684E-07	0.0013	1.307E-07	0.0006
Ni-63	0.000E+00	0.0000	3.677E-16	0.0000	1.144E-08	0.0001	1.529E-09	0.0000	6.460E-09	0.0000	7.759E-10	0.0000
Np-237	2.806E-05	0.1393	1.802E-11	0.0000	4.314E-06	0.0214	1.375E-07	0.0007	7.497E-10	0.0000	7.316E-07	0.0036
Pa-231	4.080E-08	0.0002	3.995E-13	0.0000	4.473E-08	0.0002	9.040E-09	0.0000	1.021E-11	0.0000	1.517E-08	0.0001
Pb-210	3.164E-11	0.0000	4.090E-15	0.0000	1.735E-08	0.0001	5.663E-10	0.0000	2.384E-10	0.0000	5.862E-09	0.0000
Pu-238	2.431E-10	0.0000	2.939E-12	0.0000	3.595E-08	0.0002	6.992E-10	0.0000	8.661E-12	0.0000	1.218E-07	0.0006
Pu-239	8.803E-09	0.0000	4.278E-11	0.0000	5.105E-07	0.0025	9.928E-09	0.0000	1.230E-10	0.0000	1.729E-06	0.0086
Pu-241	9.106E-17	0.0000	1.042E-19	0.0000	1.037E-15	0.0000	2.017E-17	0.0000	2.498E-19	0.0000	3.513E-15	0.0000
Ra-226	7.566E-08	0.0004	4.528E-15	0.0000	1.245E-08	0.0001	3.430E-10	0.0000	3.648E-10	0.0000	1.055E-09	0.0000
Se-79	1.642E-22	0.0000	5.198E-27	0.0000	9.581E-19	0.0000	2.427E-18	0.0000	2.516E-19	0.0000	3.241E-20	0.0000
Sn-126	1.275E-16	0.0000	1.080E-25	0.0000	9.710E-20	0.0000	8.960E-20	0.0000	1.075E-20	0.0000	1.313E-19	0.0000
Sr-90	2.907E-10	0.0000	1.159E-16	0.0000	2.885E-08	0.0001	5.510E-09	0.0000	1.421E-09	0.0000	3.262E-10	0.0000
Tc-99	1.214E-21	0.0000	9.977E-27	0.0000	1.982E-17	0.0000	4.686E-20	0.0000	4.785E-19	0.0000	1.341E-20	0.0000
Th-229	1.565E-06	0.0078	5.508E-12	0.0000	6.486E-08	0.0003	1.262E-09	0.0000	7.821E-11	0.0000	2.197E-07	0.0011
Th-230	1.081E-10	0.0000	7.884E-14	0.0000	1.043E-09	0.0000	2.029E-11	0.0000	1.257E-12	0.0000	3.532E-09	0.0000
U-233	4.138E-08	0.0002	2.101E-11	0.0000	6.791E-07	0.0034	2.120E-08	0.0001	4.513E-08	0.0002	9.209E-07	0.0046
U-234	1.076E-08	0.0001	2.065E-11	0.0000	6.696E-07	0.0033	2.090E-08	0.0001	4.450E-08	0.0002	9.080E-07	0.0045
U-235	2.283E-05	0.1133	1.856E-11	0.0000	6.844E-07	0.0034	2.136E-08	0.0001	4.548E-08	0.0002	9.280E-07	0.0046
U-238	4.703E-06	0.0233	1.755E-11	0.0000	8.454E-07	0.0042	2.639E-08	0.0001	5.618E-08	0.0003	1.146E-06	0.0057
Total	5.854E-05	0.2906	1.664E-10	0.0000	8.963E-06	0.0445	4.328E-07	0.0021	4.698E-07	0.0023	7.716E-06	0.0383

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 45
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.564E-07	0.0023
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.805E-06	0.0090
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.490E-08	0.0003
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-05	0.2501	2.601E-05	0.1291	4.893E-05	0.2429	1.267E-04	0.6288
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.020E-08	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.325E-05	0.1650
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.097E-07	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.404E-08	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.587E-07	0.0008
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.259E-06	0.0112
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.662E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.987E-08	0.0004
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-16	0.0000	8.592E-16	0.0000	1.124E-16	0.0000	1.092E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.638E-16	0.0000	3.472E-16	0.0000	4.544E-17	0.0000	9.844E-16	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.640E-08	0.0002
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	9.374E-17	0.0000	4.015E-19	0.0000	5.119E-18	0.0000	1.196E-16	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.851E-06	0.0092
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.705E-09	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.708E-06	0.0085
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.654E-06	0.0082
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.451E-05	0.1217
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.777E-06	0.0336
Total	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-05	0.2501	2.601E-05	0.1291	4.893E-05	0.2429	2.014E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 46
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	7.263E-07	0.0036	1.728E-11	0.0000	0.000E+00	0.0000	2.325E-07	0.0012	2.270E-09	0.0000	1.119E-10	0.0000	7.863E-07	0.0039
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	4.118E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.023E-24	0.0000	2.047E-24	0.0000	2.141E-25	0.0000	1.705E-25	0.0000
Cs-137	5.053E-08	0.0003	4.033E-17	0.0000	0.000E+00	0.0000	2.033E-09	0.0000	1.683E-09	0.0000	4.770E-10	0.0000	1.724E-10	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.135E-08	0.0001	5.075E-15	0.0000	0.000E+00	0.0000	7.716E-07	0.0038	1.724E-07	0.0009	2.684E-07	0.0013	1.307E-07	0.0006
Ni-63	0.000E+00	0.0000	3.677E-16	0.0000	0.000E+00	0.0000	1.144E-08	0.0001	1.529E-09	0.0000	6.460E-09	0.0000	7.759E-10	0.0000
Np-237	2.806E-05	0.1393	1.806E-11	0.0000	0.000E+00	0.0000	4.315E-06	0.0214	1.375E-07	0.0007	8.105E-10	0.0000	7.329E-07	0.0036
Pu-238	2.608E-10	0.0000	2.946E-12	0.0000	0.000E+00	0.0000	3.619E-08	0.0002	7.065E-10	0.0000	2.382E-11	0.0000	1.221E-07	0.0006
Pu-239	8.811E-09	0.0000	4.278E-11	0.0000	0.000E+00	0.0000	5.105E-07	0.0025	9.928E-09	0.0000	1.230E-10	0.0000	1.729E-06	0.0086
Pu-241	2.503E-08	0.0001	5.957E-13	0.0000	0.000E+00	0.0000	8.012E-09	0.0000	7.819E-11	0.0000	3.856E-12	0.0000	2.710E-08	0.0001
Se-79	1.642E-22	0.0000	5.198E-27	0.0000	0.000E+00	0.0000	9.581E-19	0.0000	2.427E-18	0.0000	2.516E-19	0.0000	3.241E-20	0.0000
Sn-126	1.275E-16	0.0000	1.080E-25	0.0000	0.000E+00	0.0000	9.710E-20	0.0000	8.960E-20	0.0000	1.075E-20	0.0000	1.313E-19	0.0000
Sr-90	2.907E-10	0.0000	1.159E-16	0.0000	0.000E+00	0.0000	2.885E-08	0.0001	5.510E-09	0.0000	1.421E-09	0.0000	3.262E-10	0.0000
Tc-99	1.214E-21	0.0000	9.977E-27	0.0000	0.000E+00	0.0000	1.982E-17	0.0000	4.686E-20	0.0000	4.785E-19	0.0000	1.341E-20	0.0000
U-233	1.605E-06	0.0080	2.649E-11	0.0000	0.000E+00	0.0000	7.430E-07	0.0037	2.243E-08	0.0001	4.515E-08	0.0002	1.139E-06	0.0057
U-234	8.651E-08	0.0004	2.071E-11	0.0000	0.000E+00	0.0000	6.996E-07	0.0035	2.181E-08	0.0001	4.504E-08	0.0002	9.173E-07	0.0046
U-235	2.326E-05	0.1155	1.997E-11	0.0000	0.000E+00	0.0000	7.583E-07	0.0038	3.050E-08	0.0002	4.555E-08	0.0002	9.826E-07	0.0049
U-238	4.703E-06	0.0233	1.757E-11	0.0000	0.000E+00	0.0000	8.461E-07	0.0042	2.641E-08	0.0001	5.622E-08	0.0003	1.147E-06	0.0057
Total	5.854E-05	0.2906	1.664E-10	0.0000	0.000E+00	0.0000	8.963E-06	0.0445	4.328E-07	0.0021	4.698E-07	0.0023	7.716E-06	0.0383

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 47
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.748E-06	0.0087
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.182E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.490E-08	0.0003
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-05	0.2501	2.601E-05	0.1291	4.893E-05	0.2429	1.267E-04	0.6288
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.020E-08	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.325E-05	0.1650
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.593E-07	0.0008
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.259E-06	0.0112
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.022E-08	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-16	0.0000	8.592E-16	0.0000	1.124E-16	0.0000	1.092E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.638E-16	0.0000	3.472E-16	0.0000	4.544E-17	0.0000	9.844E-16	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.640E-08	0.0002
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.374E-17	0.0000	4.015E-19	0.0000	5.119E-18	0.0000	1.196E-16	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.555E-06	0.0176
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.770E-06	0.0088
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.508E-05	0.1245
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.779E-06	0.0337
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.038E-05	0.2501	2.601E-05	0.1291	4.893E-05	0.2429	2.014E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 48
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.845E-07	1.747E+00	5.758E-03	3.868E-03	2.362E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.118E+00
Am-241	2.248E-06	8.493E+00	8.259E-02	4.092E-03	2.877E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.735E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	8.486E-16	1.281E-07	1.060E-07	3.005E-08	1.086E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.751E-07
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	7.088E-10	5.355E-02	1.196E-02	1.863E-02	9.073E-03	0.000E+00	0.000E+00	3.254E+00	1.680E+00	3.160E+00	8.187E+00
Ni-63	5.819E-09	1.098E+00	1.468E-01	6.202E-01	7.448E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.940E+00
Np-237	5.561E-06	4.199E+02	1.338E+01	7.296E-02	7.119E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.045E+02
Pa-231	1.923E-07	7.258E+00	1.467E+00	1.656E-03	2.461E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.119E+01
Pb-210	1.609E-08	6.092E-01	1.987E-02	8.369E-03	2.060E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.434E-01
Pu-238	4.005E-09	1.513E-02	2.943E-04	3.646E-06	5.127E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.670E-02
Pu-239	1.050E-05	3.966E+01	7.713E-01	9.554E-03	1.344E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.748E+02
Pu-241	1.345E-26	5.082E-20	9.883E-22	1.224E-23	1.722E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.240E-19
Ra-226	1.708E-08	2.579E+00	7.111E-02	7.560E-02	2.186E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.944E+00
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	3.403E-16	3.853E-07	7.358E-08	1.897E-08	4.356E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.822E-07
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	9.221E-07	3.484E+00	6.777E-02	4.198E-03	1.180E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E+01
Th-230	9.190E-08	3.473E-01	6.754E-03	4.184E-04	1.176E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.531E+00
U-233	9.175E-06	8.662E+01	2.704E+00	5.756E+00	1.175E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.125E+02
U-234	9.187E-06	8.673E+01	2.707E+00	5.763E+00	1.176E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.128E+02
U-235	9.184E-06	8.670E+01	2.706E+00	5.761E+00	1.176E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.127E+02
U-238	9.184E-06	8.670E+01	2.706E+00	5.761E+00	1.176E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.127E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 49
Intrisk : Residual Dose and Risk Assessment for CTUIR Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\CTUIR RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.093E-06	0.0181	2.825E-12	0.0000	8.207E-08	0.0014	2.704E-10	0.0000	1.817E-10	0.0000	1.109E-07	0.0018
Am-241	2.345E-07	0.0039	5.601E-12	0.0000	7.522E-08	0.0012	7.314E-10	0.0000	3.624E-11	0.0000	2.548E-07	0.0042
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.109E-15	0.0000	3.279E-24	0.0000	1.653E-16	0.0000	1.368E-16	0.0000	3.878E-17	0.0000	1.402E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.289E-11	0.0000	5.765E-18	0.0000	8.766E-10	0.0000	1.958E-10	0.0000	3.049E-10	0.0000	1.485E-10	0.0000
Ni-63	0.000E+00	0.0000	1.824E-18	0.0000	5.673E-11	0.0000	7.581E-12	0.0000	3.204E-11	0.0000	3.848E-12	0.0000
Np-237	1.697E-05	0.2812	1.090E-11	0.0000	2.610E-06	0.0432	8.316E-08	0.0014	4.535E-10	0.0000	4.425E-07	0.0073
Pa-231	1.075E-07	0.0018	1.053E-12	0.0000	1.179E-07	0.0020	2.383E-08	0.0004	2.689E-11	0.0000	3.998E-08	0.0007
Pb-210	2.851E-10	0.0000	3.686E-14	0.0000	1.562E-07	0.0026	5.096E-09	0.0001	2.147E-09	0.0000	5.282E-08	0.0009
Pu-238	9.281E-13	0.0000	1.122E-14	0.0000	1.373E-10	0.0000	2.670E-12	0.0000	3.307E-14	0.0000	4.651E-10	0.0000
Pu-239	8.306E-09	0.0001	4.037E-11	0.0000	4.817E-07	0.0080	9.367E-09	0.0002	1.160E-10	0.0000	1.632E-06	0.0270
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	5.997E-07	0.0099	3.589E-14	0.0000	9.866E-08	0.0016	2.721E-09	0.0000	2.893E-09	0.0000	8.366E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.247E-17	0.0000	4.970E-24	0.0000	1.238E-15	0.0000	2.363E-16	0.0000	6.093E-17	0.0000	1.399E-17	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	4.337E-06	0.0718	1.527E-11	0.0000	1.798E-07	0.0030	3.497E-09	0.0001	2.166E-10	0.0000	6.090E-07	0.0101
Th-230	3.091E-10	0.0000	2.255E-13	0.0000	2.982E-09	0.0000	5.801E-11	0.0000	3.593E-12	0.0000	1.010E-08	0.0002
U-233	3.553E-08	0.0006	1.804E-11	0.0000	5.831E-07	0.0097	1.820E-08	0.0003	3.874E-08	0.0006	7.906E-07	0.0131
U-234	9.243E-09	0.0002	1.774E-11	0.0000	5.754E-07	0.0095	1.796E-08	0.0003	3.824E-08	0.0006	7.803E-07	0.0129
U-235	1.962E-05	0.3250	1.595E-11	0.0000	5.881E-07	0.0097	1.836E-08	0.0003	3.908E-08	0.0006	7.974E-07	0.0132
U-238	4.041E-06	0.0669	1.508E-11	0.0000	7.264E-07	0.0120	2.268E-08	0.0004	4.827E-08	0.0008	9.850E-07	0.0163
Total	4.706E-05	0.7796	1.431E-10	0.0000	6.278E-06	0.1040	2.061E-07	0.0034	1.707E-07	0.0028	6.514E-06	0.1079

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 50
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.286E-06	0.0213
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.654E-07	0.0094
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.464E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	5.305E-08	0.0009	2.739E-08	0.0005	5.152E-08	0.0009	1.335E-07	0.0022
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.002E-10	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.011E-05	0.3332
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.893E-07	0.0048
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.166E-07	0.0036
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.060E-10	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.131E-06	0.0353
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.124E-07	0.0118
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-15	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.129E-06	0.0850
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.346E-08	0.0002
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.466E-06	0.0243
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-06	0.0235
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.106E-05	0.3489
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.824E-06	0.0965
Total	0.000E+00	0.0000	0.000E+00	0.0000	5.305E-08	0.0009	2.739E-08	0.0005	5.152E-08	0.0009	6.036E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 51
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	2.304E-07	0.0038	5.416E-12	0.0000	0.000E+00	0.0000	7.327E-08	0.0012	7.249E-10	0.0000	3.515E-11	0.0000	2.464E-07	0.0041
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	4.109E-15	0.0000	3.279E-24	0.0000	0.000E+00	0.0000	1.653E-16	0.0000	1.368E-16	0.0000	3.878E-17	0.0000	1.402E-17	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.289E-11	0.0000	5.765E-18	0.0000	0.000E+00	0.0000	8.766E-10	0.0000	1.958E-10	0.0000	3.049E-10	0.0000	1.485E-10	0.0000
Ni-63	0.000E+00	0.0000	1.824E-18	0.0000	0.000E+00	0.0000	5.673E-11	0.0000	7.581E-12	0.0000	3.204E-11	0.0000	3.848E-12	0.0000
Np-237	1.698E-05	0.2813	1.099E-11	0.0000	0.000E+00	0.0000	2.611E-06	0.0433	8.322E-08	0.0014	5.904E-10	0.0000	4.463E-07	0.0074
Pu-238	1.767E-10	0.0000	1.779E-14	0.0000	0.000E+00	0.0000	4.212E-10	0.0000	1.148E-11	0.0000	1.544E-11	0.0000	7.707E-10	0.0000
Pu-239	8.328E-09	0.0001	4.037E-11	0.0000	0.000E+00	0.0000	4.817E-07	0.0080	9.367E-09	0.0002	1.161E-10	0.0000	1.632E-06	0.0270
Pu-241	7.936E-09	0.0001	1.867E-13	0.0000	0.000E+00	0.0000	2.525E-09	0.0000	2.496E-11	0.0000	1.211E-12	0.0000	8.493E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.247E-17	0.0000	4.970E-24	0.0000	0.000E+00	0.0000	1.238E-15	0.0000	2.363E-16	0.0000	6.093E-17	0.0000	1.399E-17	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	4.364E-06	0.0723	3.321E-11	0.0000	0.000E+00	0.0000	7.604E-07	0.0126	2.163E-08	0.0004	3.882E-08	0.0006	1.396E-06	0.0231
U-234	6.088E-07	0.0101	1.798E-11	0.0000	0.000E+00	0.0000	8.311E-07	0.0138	2.577E-08	0.0004	4.315E-08	0.0007	8.489E-07	0.0141
U-235	2.082E-05	0.3449	1.983E-11	0.0000	0.000E+00	0.0000	7.881E-07	0.0131	4.246E-08	0.0007	3.929E-08	0.0007	9.484E-07	0.0157
U-238	4.042E-06	0.0670	1.513E-11	0.0000	0.000E+00	0.0000	7.284E-07	0.0121	2.274E-08	0.0004	4.839E-08	0.0008	9.874E-07	0.0164
Total	4.706E-05	0.7796	1.431E-10	0.0000	0.000E+00	0.0000	6.278E-06	0.1040	2.061E-07	0.0034	1.707E-07	0.0028	6.514E-06	0.1079

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/28/2014 10:38 Page 52
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.508E-07	0.0091
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.464E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.305E-08	0.0009	2.739E-08	0.0005	5.152E-08	0.0009	1.335E-07	0.0022
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.002E-10	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.012E-05	0.3333
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.396E-09	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.131E-06	0.0353
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.898E-08	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.561E-15	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.581E-06	0.1090
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.358E-06	0.0391
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.264E-05	0.3750
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.829E-06	0.0966
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.305E-08	0.0009	2.739E-08	0.0005	5.152E-08	0.0009	6.036E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Appendix D

Attachment D-8: Results of Radiological Risk Assessment for Yakama Nation Residential Receptor

Table D-8-1: Results of Radiological Risk Assessment For EA A Plus B at T = 0 Year

Nuclide	EPC pCi/g	T=0 Year RSR (1/(pCi/g)) Water Independent Pathways Ground	Inhalation	Plant	Meat	Milk	Soil	Water Dependant Pathways Plant	Meat	Milk	All Pathways	T=0 Year Risk (unitless) Water Independent Pathways Ground	Inhalation	Plant	Meat	Milk	Soil	Water Dependant Pathways Plant	Meat	Milk	All Pathways
Am-241	0.18	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	4.E-12	5.E-08	1.E-09	7.E-11	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07
C-14	3.4	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	1.E-11	5.E-10	5.E-07	4.E-07	2.E-07	4.E-10	0.E+00	0.E+00	0.E+00	1.E-06
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	1.E-03	9.E-13	4.E-05	8.E-05	3.E-05	3.E-06	0.E+00	0.E+00	0.E+00	1.E-03
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	2.E-09	1.E-11	1.E-07	5.E-09	9.E-11	3.E-07	0.E+00	0.E+00	0.E+00	4.E-07
Pu-241	1.2	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	3.E-08	8.E-13	9.E-09	3.E-10	1.E-11	2.E-08	0.E+00	0.E+00	0.E+00	6.E-08
Se-79	2.4	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	2.E-10	4.E-15	8.E-07	5.E-06	7.E-07	2.E-08	3.E-05	3.E-04	5.E-05	4.E-04
Sn-126	31.7	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	2.E-03	1.E-12	1.E-06	2.E-06	4.E-07	1.E-06	1.E-03	2.E-03	3.E-04	5.E-03
Sr-90	17.1	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	6.E-06	2.E-12	5.E-04	2.E-04	8.E-05	4.E-06	0.E+00	0.E+00	0.E+00	8.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	4.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.0089	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	3.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.19	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	8.E-07	3.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
										Excess Cancer Risk		**3.E-03**	**5.E-10**	**5.E-04**	**3.E-04**	**1.E-04**	**9.E-06**	**1.E-03**	**2.E-03**	**3.E-04**	**8.E-03**

Table D-8-2: Results of Radiological Risk Assessment For EA A Plus B at T = 19.8 Year

Nuclide	EPC	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ter Dependant Pathw			All	Water Independent Pathways						Water Dependant Pathways			All
	pCi/g	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways
Am-241	0.18	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	4.E-12	5.E-08	1.E-09	7.E-11	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
C-14	3.4	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	3.E-24	2.E-22	2.E-19	1.E-19	7.E-20	1.E-22	0.E+00	0.E+00	0.E+00	4.E-19
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	8.E-04	5.E-13	3.E-05	5.E-05	2.E-05	2.E-06	0.E+00	0.E+00	0.E+00	9.E-04
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	2.E-09	1.E-11	1.E-07	5.E-09	9.E-11	3.E-07	0.E+00	0.E+00	0.E+00	4.E-07
Pu-241	1.2	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	3.E-08	8.E-13	1.E-08	2.E-10	1.E-11	3.E-08	0.E+00	0.E+00	0.E+00	7.E-08
Se-79	2.4	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	3.E-11	7.E-16	1.E-07	8.E-07	1.E-07	3.E-09	3.E-05	3.E-04	5.E-05	4.E-04
Sn-126	31.7	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	3.E-04	2.E-13	2.E-07	4.E-07	6.E-08	2.E-07	1.E-03	2.E-03	3.E-04	3.E-03
Sr-90	17.1	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	4.E-06	1.E-12	3.E-04	1.E-04	5.E-05	3.E-06	0.E+00	0.E+00	0.E+00	5.E-04
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	4.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.0089	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.19	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	8.E-07	3.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-03**	**2.E-11**	**3.E-04**	**2.E-04**	**7.E-05**	**5.E-06**	**1.E-03**	**2.E-03**	**3.E-04**	**5.E-03**

Table D-8-3: Results of Radiological Risk Assessment For EA A Plus B at T = 1000 Year

Nuclide	EPC	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						/ater Dependant Pathwa			All	Water Independent Pathways						Water Dependant Pathways			All
	pCi/g	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways
Am-241	0.18	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	3.E-08	7.E-13	9.E-09	2.E-10	1.E-11	2.E-08	0.E+00	0.E+00	0.E+00	7.E-08
C-14	3.4	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	27.7	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	9.E-14	6.E-23	3.E-15	6.E-15	2.E-15	2.E-16	0.E+00	0.E+00	0.E+00	1.E-13
H-3	0	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0.31	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	2.E-09	9.E-12	1.E-07	5.E-09	8.E-11	3.E-07	0.E+00	0.E+00	0.E+00	4.E-07
Pu-241	1.2	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	8.E-09	2.E-13	2.E-09	5.E-11	3.E-12	6.E-09	0.E+00	0.E+00	0.E+00	2.E-08
Se-79	2.4	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	31.7	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	17.1	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	2.E-16	6.E-23	2.E-14	7.E-15	2.E-15	1.E-16	0.E+00	0.E+00	0.E+00	2.E-14
Tc-99	0	0E+00	0E+00	0E+00	#####	0E+00	#####	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0.26	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	1.E-07	3.E-12	2.E-07	1.E-08	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.0089	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	6.E-10	8.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.19	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	6.E-07	2.E-12	1.E-07	7.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	9.E-07
											Excess Cancer Risk	**1.E-06**	**2.E-11**	**4.E-07**	**2.E-08**	**5.E-08**	**5.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-06**

Table D-8-4: Results of Radiological Risk Assessment For EA C at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						ater Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.09	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	3.E-04	2.E-13	1.E-05	2.E-05	8.E-06	7.E-07	0.E+00	0.E+00	0.E+00	4.E-04
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	1.E-14	4.E-07	1.E-07	6.E-07	2.E-08	0.E+00	0.E+00	0.E+00	1.E-06
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	3.E-03	2.E-12	2.E-06	4.E-06	6.E-07	2.E-06	2.E-03	3.E-03	5.E-04	8.E-03
Sr-90	3	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	1.E-06	4.E-13	9.E-05	4.E-05	1.E-05	8.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	3.E-07	2.E-13	7.E-09	5.E-10	1.E-09	7.E-09	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.28	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**3.E-03**	**7.E-12**	**1.E-04**	**6.E-05**	**2.E-05**	**4.E-06**	**2.E-03**	**3.E-03**	**5.E-04**	**8.8.E-03**

Table D-8-5: Results of Radiological Risk Assessment For EA C at T = 19.8 Year

		T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
Nuclide	EPC (pCi/g)	Water Independent Pathways						/ater Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	2.E-04	1.E-13	7.E-06	1.E-05	5.E-06	5.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	1.E-14	3.E-07	9.E-08	5.E-07	2.E-08	0.E+00	0.E+00	0.E+00	1.E-06
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	5.E-04	3.E-13	3.E-07	6.E-07	1.E-07	3.E-07	2.E-03	3.E-03	5.E-04	6.E-03
Sr-90	3	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	6.E-07	2.E-13	5.E-05	2.E-05	8.E-06	5.E-07	0.E+00	0.E+00	0.E+00	9.E-05
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	3.E-07	2.E-13	7.E-09	5.E-10	1.E-09	7.E-09	0.E+00	0.E+00	0.E+00	3.E-07
U-238	0.28	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**7.E-04**	**5.E-12**	**6.E-05**	**4.E-05**	**1.E-05**	**1.E-06**	**2.E-03**	**3.E-03**	**5.E-04**	**6.E-03**

Table D-8-6: Results of Radiological Risk Assessment For EA C at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	7.1	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	2.E-14	2.E-23	8.E-16	2.E-15	6.E-16	5.E-17	0.E+00	0.E+00	0.E+00	3.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	4.5	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	6.E-18	2.E-10	6.E-11	3.E-10	9.E-12	0.E+00	0.E+00	0.E+00	6.E-10
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	53.1	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	3	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	3.E-17	1.E-23	3.E-15	1.E-15	4.E-16	2.E-17	0.E+00	0.E+00	0.E+00	4.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.013	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	2.E-13	7.E-09	9.E-10	1.E-09	7.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.28	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-06**	**3.E-12**	**2.E-07**	**1.E-08**	**3.E-08**	**2.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-06**

Table D-8-7: Results of Radiological Risk Assessment For EA E at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	2.E-04	2.E-13	8.E-06	2.E-05	6.E-06	5.E-07	0.E+00	0.E+00	0.E+00	3.E-04
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	2.E-10	7.E-15	1.E-06	7.E-06	1.E-06	3.E-08	4.E-05	5.E-04	9.E-05	6.E-04
Sn-126	18.5	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	9.E-04	7.E-13	6.E-07	1.E-06	2.E-07	6.E-07	9.E-04	9.E-04	2.E-04	3.E-03
Sr-90	2.5	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	9.E-07	3.E-13	7.E-05	3.E-05	1.E-05	6.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	3.E-11	1.E-06	7.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.45	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	5.E-09	7.E-12	2.E-07	2.E-08	5.E-08	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.0012	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-08	2.E-14	6.E-10	5.E-11	1.E-10	6.E-10	0.E+00	0.E+00	0.E+00	3.E-08
U-238	0.28	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
				Excess Cancer Risk								**1.E-03**	**4.E-11**	**8.E-05**	**6.E-05**	**2.E-05**	**3.E-06**	**9.E-04**	**1.E-03**	**3.E-04**	**4.E-03**

Table D-8-8: Results of Radiological Risk Assessment For EA E at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	1.E-04	1.E-13	5.E-06	1.E-05	4.E-06	3.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	4.E-11	1.E-15	2.E-07	1.E-06	2.E-07	5.E-09	4.E-05	5.E-04	8.E-05	6.E-04
Sn-126	18.5	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	2.E-04	1.E-13	1.E-07	2.E-07	4.E-08	1.E-07	8.E-04	9.E-04	2.E-04	2.E-03
Sr-90	2.5	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	5.E-07	2.E-13	5.E-05	2.E-05	7.E-06	4.E-07	0.E+00	0.E+00	0.E+00	7.E-05
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	5.E-07	3.E-11	1.E-06	7.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.45	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	5.E-09	7.E-12	2.E-07	2.E-08	5.E-08	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.0012	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-08	2.E-14	6.E-10	5.E-11	1.E-10	6.E-10	0.E+00	0.E+00	0.E+00	3.E-08
U-238	0.28	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	4.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**3.E-04**	**4.E-11**	**5.E-05**	**3.E-05**	**1.E-05**	**2.E-06**	**8.E-04**	**1.E-03**	**2.E-04**	**3.E-03**

Table D-8-9: Results of Radiological Risk Assessment For EA E at T =1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.1	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	2.E-14	1.E-23	6.E-16	1.E-15	4.E-16	4.E-17	0.E+00	0.E+00	0.E+00	2.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	3.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	18.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2.5	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	3.E-17	9.E-24	2.E-15	1.E-15	3.E-16	2.E-17	0.E+00	0.E+00	0.E+00	4.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	7.E-06	5.E-11	1.E-06	7.E-08	2.E-07	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.45	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	6.E-12	3.E-07	2.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	8.E-07
U-235	0.0012	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-08	2.E-14	7.E-10	8.E-11	1.E-10	6.E-10	0.E+00	0.E+00	0.E+00	2.E-08
U-238	0.28	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**8.E-06**	**6.E-11**	**1.E-06**	**1.E-07**	**2.E-07**	**2.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-8-10: Results of Radiological Risk Assessment For EA F Plus G at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	4.E-11	2.E-09	2.E-06	2.E-06	8.E-07	1.E-09	0.E+00	0.E+00	0.E+00	4.E-06
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	1.E-04	1.E-13	5.E-06	1.E-05	4.E-06	3.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	2.E-10	4.E-15	8.E-07	5.E-06	7.E-07	2.E-08	3.E-05	3.E-04	5.E-05	4.E-04
Sn-126	2.6	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	1.E-04	1.E-13	9.E-08	2.E-07	3.E-08	9.E-08	1.E-04	1.E-04	2.E-05	4.E-04
Sr-90	0.3	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	1.E-07	4.E-14	9.E-06	4.E-06	1.E-06	8.E-08	0.E+00	0.E+00	0.E+00	1.E-05
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-07	2.E-11	8.E-07	6.E-08	2.E-07	8.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.3	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	5.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.24	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	3.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**3.E-04**	**2.E-09**	**2.E-05**	**2.E-05**	**7.E-06**	**2.E-06**	**1.E-04**	**4.E-04**	**8.E-05**	**1.E-03**

Table D-8-11: Results of Radiological Risk Assessment For EA F Plus G at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	1.E-23	6.E-22	6.E-19	5.E-19	3.E-19	5.E-22	0.E+00	0.E+00	0.E+00	1.E-18
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	9.E-05	6.E-14	3.E-06	6.E-06	2.E-06	2.E-07	0.E+00	0.E+00	0.E+00	1.E-04
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	3.E-11	7.E-16	1.E-07	8.E-07	1.E-07	3.E-09	3.E-05	3.E-04	5.E-05	4.E-04
Sn-126	2.6	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	2.E-05	2.E-14	1.E-08	3.E-08	5.E-09	2.E-08	1.E-04	1.E-04	2.E-05	3.E-04
Sr-90	0.3	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	6.E-08	2.E-14	5.E-06	2.E-06	8.E-07	5.E-08	0.E+00	0.E+00	0.E+00	9.E-06
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	2.E-11	8.E-07	6.E-08	2.E-07	8.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.3	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	5.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.24	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	1.E-06	3.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-04**	**3.E-11**	**1.E-05**	**9.E-06**	**4.E-06**	**1.E-06**	**1.E-04**	**4.E-04**	**7.E-05**	**8.E-04**

Table D-8-12: Results of Radiological Risk Assessment For EA F Plus G at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	12.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.2	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	1.E-14	7.E-24	4.E-16	7.E-16	3.E-16	2.E-17	0.E+00	0.E+00	0.E+00	1.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	2.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.3	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	3.E-18	1.E-24	3.E-16	1.E-16	4.E-17	2.E-18	0.E+00	0.E+00	0.E+00	4.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	5.E-06	4.E-11	8.E-07	5.E-08	1.E-07	1.E-06	0.E+00	0.E+00	0.E+00	7.E-06
U-234	0.3	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	1.E-07	4.E-12	2.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.01	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	6.E-09	7.E-10	9.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.24	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	8.E-07	3.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**6.E-06**	**4.E-11**	**1.E-06**	**8.E-08**	**2.E-07**	**1.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**9.E-06**

Table D-8-13: Results of Radiological Risk Assessment For EA H Plus I at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	1.E-11	5.E-10	5.E-07	4.E-07	2.E-07	4.E-10	0.E+00	0.E+00	0.E+00	1.E-06
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	6.E-07	2.E-06	8.E-07	8.E-07	8.E-10	5.E-07	8.E-08	2.E-07	5.E-06
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	2.E-10	5.E-15	9.E-07	5.E-06	7.E-07	2.E-08	3.E-05	3.E-04	6.E-05	4.E-04
Sn-126	7.7	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	4.E-04	3.E-13	3.E-07	5.E-07	9.E-08	3.E-07	4.E-04	4.E-04	7.E-05	1.E-03
Sr-90	0	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-07	3.E-11	8.E-07	6.E-08	2.E-07	9.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.35	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-09	5.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.0078	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	4.E-09	3.E-10	8.E-10	4.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.18	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	7.E-07	2.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**4.E-04**	**6.E-07**	**5.E-06**	**7.E-06**	**2.E-06**	**1.E-06**	**4.E-04**	**7.E-04**	**1.E-04**	**2.E-03**

Table D-8-14: Results of Radiological Risk Assessment For EA H Plus I at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	3.E-24	2.E-22	2.E-19	2.E-19	7.E-20	1.E-22	0.E+00	0.E+00	0.E+00	4.E-19
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	5.E-16	2.E-15	6.E-16	6.E-16	6.E-19	2.E-07	4.E-08	8.E-08	3.E-07
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	3.E-11	8.E-16	2.E-07	9.E-07	1.E-07	4.E-09	3.E-05	3.E-04	6.E-05	4.E-04
Sn-126	7.7	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	7.E-05	5.E-14	4.E-08	9.E-08	2.E-08	4.E-08	3.E-04	4.E-04	7.E-05	8.E-04
Sr-90	0	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	3.E-11	8.E-07	6.E-08	2.E-07	9.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.35	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-09	5.E-12	2.E-07	1.E-08	4.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.0078	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	4.E-09	3.E-10	8.E-10	4.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.18	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	7.E-07	2.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
				Excess Cancer Risk								**7.E-05**	**3.E-11**	**1.E-06**	**1.E-06**	**4.E-07**	**1.E-06**	**4.E-04**	**7.E-04**	**1.E-04**	**1.E-03**

Table D-8-15: Results of Radiological Risk Assessment For EA H Plus I at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent						Water Dependant			All Pathways	Water Independent						Water Dependant			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	3.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	75.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	7.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.6	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	6.E-06	4.E-11	9.E-07	6.E-08	1.E-07	1.E-06	0.E+00	0.E+00	0.E+00	8.E-06
U-234	0.35	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	4.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	6.E-07
U-235	0.0078	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	1.E-07	1.E-13	4.E-09	5.E-10	7.E-10	4.E-09	0.E+00	0.E+00	0.E+00	1.E-07
U-238	0.18	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	6.E-07	2.E-12	9.E-08	7.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	8.E-07
											Excess Cancer Risk	**7.E-06**	**4.E-11**	**1.E-06**	**8.E-08**	**2.E-07**	**1.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-8-16: Results of Radiological Risk Assessment For EA J at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g))										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	4.E-11	2.E-09	2.E-06	2.E-06	8.E-07	2.E-09	0.E+00	0.E+00	0.E+00	4.E-06
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	3.E-04	2.E-13	9.E-06	2.E-05	7.E-06	6.E-07	0.E+00	0.E+00	0.E+00	3.E-04
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	1.E-10	2.E-12	2.E-08	8.E-10	1.E-11	5.E-08	0.E+00	0.E+00	0.E+00	7.E-08
Pu-239	0.038	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	3.E-10	1.E-12	1.E-08	6.E-10	1.E-11	4.E-08	0.E+00	0.E+00	0.E+00	5.E-08
Pu-241	0.14	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	3.E-09	9.E-14	1.E-09	3.E-11	2.E-12	3.E-09	0.E+00	0.E+00	0.E+00	7.E-09
Se-79	11.3	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	7.E-10	2.E-14	4.E-06	2.E-05	3.E-06	1.E-07	1.E-04	1.E-03	3.E-04	2.E-03
Sn-126	0	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	1.E-06	5.E-13	1.E-04	5.E-05	2.E-05	1.E-06	0.E+00	0.E+00	0.E+00	2.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**3.E-04**	**2.E-09**	**1.E-04**	**9.E-05**	**3.E-05**	**2.E-06**	**1.E-04**	**1.E-03**	**3.E-04**	**2.E-03**

Table D-8-17: Results of Radiological Risk Assessment For EA J at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	1.E-23	7.E-22	6.E-19	6.E-19	3.E-19	5.E-22	0.E+00	0.E+00	0.E+00	2.E-18
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	2.E-04	1.E-13	6.E-06	1.E-05	4.E-06	4.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	1.E-10	1.E-12	2.E-08	7.E-10	1.E-11	4.E-08	0.E+00	0.E+00	0.E+00	6.E-08
Pu-239	0.038	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	3.E-10	1.E-12	1.E-08	6.E-10	1.E-11	4.E-08	0.E+00	0.E+00	0.E+00	5.E-08
Pu-241	0.14	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	4.E-09	9.E-14	1.E-09	3.E-11	2.E-12	3.E-09	0.E+00	0.E+00	0.E+00	8.E-09
Se-79	11.3	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	1.E-10	3.E-15	6.E-07	4.E-06	5.E-07	2.E-08	1.E-04	1.E-03	2.E-04	2.E-03
Sn-126	0	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	8.E-07	3.E-13	7.E-05	3.E-05	1.E-05	6.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**2.E-04**	**6.E-12**	**8.E-05**	**5.E-05**	**2.E-05**	**1.E-06**	**1.E-04**	**1.E-03**	**2.E-04**	**2.E-03**

Table D-8-18: Results of Radiological Risk Assessment For EA J at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g))										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathways			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	13.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	5.7	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	2.E-14	1.E-23	7.E-16	1.E-15	5.E-16	4.E-17	0.E+00	0.E+00	0.E+00	2.E-14
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0.067	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	1.E-11	8.E-16	2.E-11	1.E-12	2.E-12	3.E-11	0.E+00	0.E+00	0.E+00	6.E-11
Pu-239	0.038	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	3.E-10	1.E-12	1.E-08	6.E-10	1.E-11	3.E-08	0.E+00	0.E+00	0.E+00	5.E-08
Pu-241	0.14	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	9.E-10	2.E-14	3.E-10	6.E-12	4.E-13	6.E-10	0.E+00	0.E+00	0.E+00	2.E-09
Se-79	11.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	4.E-17	1.E-23	4.E-15	2.E-15	5.E-16	3.E-17	0.E+00	0.E+00	0.E+00	6.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	0	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-234	0	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-235	0.01	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	6.E-09	7.E-10	9.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	7.E-07	2.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**9.E-07**	**4.E-12**	**1.E-07**	**9.E-09**	**2.E-08**	**2.E-07**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-06**

Table D-8-19: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	2.E-10	8.E-09	7.E-06	7.E-06	3.E-06	6.E-09	0.E+00	0.E+00	0.E+00	2.E-05
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	2.E-04	1.E-13	6.E-06	1.E-05	4.E-06	4.E-07	0.E+00	0.E+00	0.E+00	2.E-04
H-3	4.7	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	4.E-08	1.E-07	5.E-08	5.E-08	5.E-11	3.E-08	5.E-09	1.E-08	3.E-07
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	1.E-12	3.E-05	9.E-06	5.E-05	2.E-06	0.E+00	0.E+00	0.E+00	1.E-04
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	1.E-10	3.E-15	5.E-07	3.E-06	4.E-07	1.E-08	2.E-05	2.E-04	4.E-05	3.E-04
Sn-126	8.9	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	5.E-04	3.E-13	3.E-07	6.E-07	1.E-07	3.E-07	4.E-04	5.E-04	8.E-05	1.E-03
Sr-90	2	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	7.E-07	2.E-13	6.E-05	3.E-05	9.E-06	5.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-07	2.E-11	8.E-07	6.E-08	2.E-07	8.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.25	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	4.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.23	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**6.E-04**	**5.E-08**	**1.E-04**	**6.E-05**	**7.E-05**	**4.E-06**	**4.E-04**	**7.E-04**	**1.E-04**	**2.E-03**

Table D-8-20: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year RSR (1/(pCi/g)										T=19.8 Year Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	5.E-23	3.E-21	2.E-18	2.E-18	1.E-18	2.E-21	0.E+00	0.E+00	0.E+00	6.E-18
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	1.E-04	7.E-14	3.E-06	7.E-06	3.E-06	2.E-07	0.E+00	0.E+00	0.E+00	1.E-04
H-3	4.7	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	3.E-17	1.E-16	4.E-17	4.E-17	4.E-20	1.E-08	3.E-09	5.E-09	2.E-08
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	9.E-13	3.E-05	8.E-06	5.E-05	1.E-06	0.E+00	0.E+00	0.E+00	8.E-05
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	2.E-11	5.E-16	9.E-08	5.E-07	7.E-08	2.E-09	2.E-05	2.E-04	3.E-05	2.E-04
Sn-126	8.9	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	8.E-05	6.E-14	5.E-08	1.E-07	2.E-08	5.E-08	4.E-04	4.E-04	8.E-05	1.E-03
Sr-90	2	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	4.E-07	1.E-13	4.E-05	2.E-05	6.E-06	3.E-07	0.E+00	0.E+00	0.E+00	6.E-05
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	2.E-11	8.E-07	6.E-08	2.E-07	8.E-07	0.E+00	0.E+00	0.E+00	2.E-06
U-234	0.25	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	4.E-12	1.E-07	9.E-09	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.23	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**2.E-04**	**3.E-11**	**7.E-05**	**3.E-05**	**6.E-05**	**3.E-06**	**4.E-04**	**6.E-04**	**1.E-04**	**1.E-03**

Table D-8-21: Results of Radiological Risk Assessment For EA L1 Plus L2 at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	53.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	3.5	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	1.E-14	8.E-24	4.E-16	8.E-16	3.E-16	3.E-17	0.E+00	0.E+00	0.E+00	1.E-14
H-3	4.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	390	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	5.E-16	2.E-08	5.E-09	3.E-08	8.E-10	0.E+00	0.E+00	0.E+00	5.E-08
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	1.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	8.9	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	2	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	2.E-17	7.E-24	2.E-15	8.E-16	3.E-16	2.E-17	0.E+00	0.E+00	0.E+00	3.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.5	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	5.E-06	4.E-11	8.E-07	5.E-08	1.E-07	1.E-06	0.E+00	0.E+00	0.E+00	7.E-06
U-234	0.25	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	1.E-07	3.E-12	1.E-07	1.E-08	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	6.E-09	7.E-10	9.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.23	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	8.E-07	2.E-12	1.E-07	9.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**6.E-06**	**4.E-11**	**1.E-06**	**8.E-08**	**2.E-07**	**1.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**9.E-06**

Table D-8-22: Results of Radiological Risk Assessment For EA P at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	2.E-06	4.E-11	6.E-07	1.E-08	9.E-10	2.E-06	0.E+00	0.E+00	0.E+00	4.E-06
C-14	0	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	4.E-05	5.E-15	3.E-07	4.E-07	6.E-08	1.E-08	0.E+00	0.E+00	0.E+00	4.E-05
Cs-137	32.1	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	1.E-03	1.E-12	5.E-05	1.E-04	4.E-05	3.E-06	0.E+00	0.E+00	0.E+00	2.E-03
H-3	308	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	2.E-06	9.E-06	3.E-06	3.E-06	3.E-09	2.E-06	3.E-07	6.E-07	2.E-05
I-129	0.81	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	1.E-07	5.E-14	8.E-06	4.E-06	9.E-06	1.E-06	0.E+00	0.E+00	0.E+00	2.E-05
Ni-63	85	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	2.E-13	7.E-06	2.E-06	1.E-05	3.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Np-237	1.5	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	4.E-05	2.E-11	6.E-06	4.E-07	3.E-09	7.E-07	0.E+00	0.E+00	0.E+00	5.E-05
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	8.E-08	3.E-10	4.E-06	2.E-07	3.E-09	1.E-05	0.E+00	0.E+00	0.E+00	1.E-05
Pu-241	39.9	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	9.E-07	2.E-11	3.E-07	8.E-09	4.E-10	8.E-07	0.E+00	0.E+00	0.E+00	2.E-06
Se-79	4.6	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	3.E-10	8.E-15	2.E-06	9.E-06	1.E-06	4.E-08	5.E-05	6.E-04	1.E-04	7.E-04
Sn-126	0	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	3.E-05	1.E-11	2.E-03	1.E-03	4.E-04	2.E-05	0.E+00	0.E+00	0.E+00	4.E-03
Tc-99	24	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	1.E-08	8.E-14	2.E-04	9.E-07	1.E-05	8.E-08	2.E-04	1.E-06	2.E-05	4.E-04
U-233	1.9	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-07	3.E-11	1.E-06	7.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.72	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	7.E-09	1.E-11	4.E-07	3.E-08	8.E-08	4.E-07	0.E+00	0.E+00	0.E+00	9.E-07
U-235	0.025	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	5.E-07	4.E-13	1.E-08	1.E-09	3.E-09	1.E-08	0.E+00	0.E+00	0.E+00	5.E-07
U-238	0.52	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	2.E-06	7.E-12	3.E-07	2.E-08	7.E-08	3.E-07	0.E+00	0.E+00	0.E+00	3.E-06
											Excess Cancer Risk	**2.E-03**	**2.E-06**	**3.E-03**	**1.E-03**	**4.E-04**	**4.E-05**	**2.E-04**	**6.E-04**	**1.E-04**	**7.E-03**

Table D-8-23: Results of Radiological Risk Assessment For EA P at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	2.E-06	4.E-11	6.E-07	1.E-08	9.E-10	1.E-06	0.E+00	0.E+00	0.E+00	4.E-06
C-14	0	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	3.E-06	4.E-16	3.E-08	3.E-08	4.E-09	8.E-10	0.E+00	0.E+00	0.E+00	3.E-06
Cs-137	32.1	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	9.E-04	6.E-13	3.E-05	6.E-05	2.E-05	2.E-06	0.E+00	0.E+00	0.E+00	1.E-03
H-3	308	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	2.E-15	7.E-15	2.E-15	2.E-15	3.E-18	9.E-07	2.E-07	3.E-07	1.E-06
I-129	0.81	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	1.E-07	4.E-14	7.E-06	3.E-06	7.E-06	9.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Ni-63	85	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	2.E-13	6.E-06	2.E-06	1.E-05	3.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Np-237	1.5	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	4.E-05	2.E-11	6.E-06	4.E-07	3.E-09	7.E-07	0.E+00	0.E+00	0.E+00	5.E-05
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	8.E-08	3.E-10	4.E-06	2.E-07	3.E-09	1.E-05	0.E+00	0.E+00	0.E+00	1.E-05
Pu-241	39.9	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	1.E-06	3.E-11	3.E-07	8.E-09	5.E-10	9.E-07	0.E+00	0.E+00	0.E+00	2.E-06
Se-79	4.6	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	5.E-11	1.E-15	3.E-07	2.E-06	2.E-07	7.E-09	5.E-05	5.E-04	1.E-04	7.E-04
Sn-126	0	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	2.E-05	6.E-12	1.E-03	7.E-04	2.E-04	1.E-05	0.E+00	0.E+00	0.E+00	2.E-03
Tc-99	24	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	2.E-09	1.E-14	3.E-05	2.E-07	2.E-06	1.E-08	2.E-04	1.E-06	2.E-05	2.E-04
U-233	1.9	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	5.E-07	3.E-11	1.E-06	7.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.72	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	8.E-09	1.E-11	4.E-07	3.E-08	8.E-08	4.E-07	0.E+00	0.E+00	0.E+00	9.E-07
U-235	0.025	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	5.E-07	4.E-13	1.E-08	1.E-09	3.E-09	1.E-08	0.E+00	0.E+00	0.E+00	5.E-07
U-238	0.52	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	2.E-06	7.E-12	3.E-07	2.E-08	7.E-08	3.E-07	0.E+00	0.E+00	0.E+00	3.E-06
											Excess Cancer Risk	**1.E-03**	**5.E-10**	**2.E-03**	**7.E-04**	**3.E-04**	**3.E-05**	**2.E-04**	**6.E-04**	**1.E-04**	**5.E-03**

Table D-8-24: Results of Radiological Risk Assessment For EA P at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	2.2	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	4.E-07	8.E-12	1.E-07	3.E-09	2.E-10	3.E-07	0.E+00	0.E+00	0.E+00	8.E-07
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0.83	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	32.1	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	1.E-13	7.E-23	4.E-15	7.E-15	3.E-15	2.E-16	0.E+00	0.E+00	0.E+00	1.E-13
H-3	308	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0.81	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	9.E-12	3.E-18	5.E-10	3.E-10	6.E-10	7.E-11	5.E-08	4.E-08	9.E-08	2.E-07
Ni-63	85	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	1.E-16	3.E-09	1.E-09	6.E-09	2.E-10	0.E+00	0.E+00	0.E+00	1.E-08
Np-237	1.5	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	2.E-05	1.E-11	3.E-06	2.E-07	2.E-09	4.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	10.7	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	7.E-08	3.E-10	4.E-06	2.E-07	3.E-09	9.E-06	0.E+00	0.E+00	0.E+00	1.E-05
Pu-241	39.9	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	3.E-07	5.E-12	7.E-08	2.E-09	1.E-10	2.E-07	0.E+00	0.E+00	0.E+00	5.E-07
Se-79	4.6	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	82.2	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	8.E-16	3.E-22	7.E-14	3.E-14	1.E-14	6.E-16	0.E+00	0.E+00	0.E+00	1.E-13
Tc-99	24	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	1.9	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	7.E-06	4.E-11	1.E-06	7.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	9.E-06
U-234	0.72	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	4.E-07	9.E-12	4.E-07	3.E-08	7.E-08	3.E-07	0.E+00	0.E+00	0.E+00	1.E-06
U-235	0.025	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	4.E-07	4.E-13	1.E-08	2.E-09	2.E-09	1.E-08	0.E+00	0.E+00	0.E+00	5.E-07
U-238	0.52	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	2.E-06	6.E-12	3.E-07	2.E-08	6.E-08	3.E-07	0.E+00	0.E+00	0.E+00	2.E-06
											Excess Cancer Risk	**3.E-05**	**4.E-10**	**8.E-06**	**5.E-07**	**3.E-07**	**1.E-05**	**5.E-08**	**4.E-08**	**9.E-08**	**5.E-05**

Table D-8-25: Results of Radiological Risk Assessment For EA R at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year RSR (1/(pCi/g))										T=0 Year Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All	Water Independent Pathways						Water Dependant Pathway			All
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways	Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	Pathways
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	2.E-08	7.E-08	3.E-08	2.E-08	3.E-11	2.E-08	3.E-09	5.E-09	2.E-07
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	1.E-07	4.E-14	1.E-05	5.E-06	2.E-06	9.E-08	0.E+00	0.E+00	0.E+00	2.E-05
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	4.E-11	1.E-06	9.E-08	3.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.22	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	2.E-09	3.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**2.E-06**	**2.E-08**	**1.E-05**	**5.E-06**	**2.E-06**	**2.E-06**	**2.E-08**	**3.E-09**	**5.E-09**	**2.E-05**

Table D-7-26: Results of Radiological Risk Assessment For EA R at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	2.E-17	5.E-17	2.E-17	2.E-17	2.E-20	7.E-09	1.E-09	3.E-09	1.E-08
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	8.E-08	3.E-14	7.E-06	3.E-06	1.E-06	6.E-08	0.E+00	0.E+00	0.E+00	1.E-05
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	6.E-07	4.E-11	1.E-06	9.E-08	3.E-07	1.E-06	0.E+00	0.E+00	0.E+00	4.E-06
U-234	0.22	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	3.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	3.E-07
U-235	0.01	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**2.E-06**	**5.E-11**	**8.E-06**	**3.E-06**	**1.E-06**	**2.E-06**	**7.E-09**	**1.E-09**	**3.E-09**	**2.E-05**

Table D-8-27: Results of Radiological Risk Assessment For EA R at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathway			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	0	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
H-3	2.5	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	0.37	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	4.E-18	1.E-24	3.E-16	1.E-16	5.E-17	3.E-18	0.E+00	0.E+00	0.E+00	5.E-16
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.4	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	9.E-06	6.E-11	1.E-06	9.E-08	2.E-07	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.22	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	1.E-07	3.E-12	1.E-07	9.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.01	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	6.E-09	7.E-10	9.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.22	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	7.E-07	2.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-05**	**6.E-11**	**2.E-06**	**1.E-07**	**3.E-07**	**2.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**1.E-05**

Table D-8-28: Results of Radiological Risk Assessment For EA U at T = 0 Year

Nuclide	EPC (pCi/g)	T=0 Year										T=0 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	1E-06	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	3E-12	1E-10	1E-07	1E-07	6E-08	1E-10	0E+00	0E+00	0E+00	3E-07	5.E-12	2.E-10	2.E-07	2.E-07	1.E-07	2.E-10	0.E+00	0.E+00	0.E+00	6.E-07
Co-60	0	5E-05	6E-15	4E-07	5E-07	7E-08	1E-08	0E+00	0E+00	0E+00	5E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	5E-05	3E-14	2E-06	3E-06	1E-06	1E-07	0E+00	0E+00	0E+00	5E-05	1.E-04	7.E-14	3.E-06	6.E-06	2.E-06	2.E-07	0.E+00	0.E+00	0.E+00	1.E-04
H-3	0	0E+00	8E-09	3E-08	1E-08	1E-08	1E-11	6E-09	1E-09	2E-09	7E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	2E-07	7E-14	1E-05	5E-06	1E-05	1E-06	0E+00	0E+00	0E+00	3E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	3E-15	8E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	2.E-05	1.E-11	2.E-06	2.E-07	1.E-09	3.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Pu-238	0	2E-09	2E-11	3E-07	1E-08	2E-10	7E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	2E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	5E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	7E-11	2E-15	3E-07	2E-06	3E-07	9E-09	1E-05	1E-04	2E-05	2E-04	2.E-10	5.E-15	9.E-07	5.E-06	8.E-07	2.E-08	3.E-05	4.E-04	6.E-05	5.E-04
Sn-126	6.3	5E-05	4E-14	3E-08	7E-08	1E-08	3E-08	5E-05	5E-05	9E-06	2E-04	3.E-04	2.E-13	2.E-07	4.E-07	7.E-08	2.E-07	3.E-04	3.E-04	6.E-05	1.E-03
Sr-90	4.2	3E-07	1E-13	3E-05	1E-05	5E-06	3E-07	0E+00	0E+00	0E+00	5E-05	1.E-06	5.E-13	1.E-04	5.E-05	2.E-05	1.E-06	0.E+00	0.E+00	0.E+00	2.E-04
Tc-99	0	5E-10	3E-15	7E-06	4E-08	5E-07	4E-09	8E-06	6E-08	1E-06	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	2E-07	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-07	3.E-11	1.E-06	8.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.31	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	3.E-09	5.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.0089	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	3.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.21	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**4.E-04**	**3.E-10**	**1.E-04**	**7.E-05**	**2.E-05**	**3.E-06**	**3.2.E-04**	**7.E-04**	**1.E-04**	**1.8.E-03**

Table D-8-29: Results of Radiological Risk Assessment For EA U at T = 19.8 Year

Nuclide	EPC (pCi/g)	T=19.8 Year										T=19.8 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	9E-07	2E-11	3E-07	6E-09	4E-10	7E-07	0E+00	0E+00	0E+00	2E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	1E-24	5E-23	5E-20	4E-20	2E-20	4E-23	0E+00	0E+00	0E+00	1E-19	2.E-24	8.E-23	8.E-20	7.E-20	3.E-20	6.E-23	0.E+00	0.E+00	0.E+00	2.E-19
Co-60	0	4E-06	5E-16	3E-08	4E-08	5E-09	1E-09	0E+00	0E+00	0E+00	4E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	3E-05	2E-14	1E-06	2E-06	7E-07	6E-08	0E+00	0E+00	0E+00	3E-05	6.E-05	4.E-14	2.E-06	4.E-06	2.E-06	1.E-07	0.E+00	0.E+00	0.E+00	7.E-05
H-3	0	0E+00	6E-18	2E-17	8E-18	8E-18	8E-21	3E-09	6E-10	1E-09	5E-09	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-07	5E-14	8E-06	4E-06	9E-06	1E-06	0E+00	0E+00	0E+00	2E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	2E-15	7E-08	2E-08	1E-07	4E-09	0E+00	0E+00	0E+00	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	3E-05	2E-11	4E-06	3E-07	2E-09	5E-07	0E+00	0E+00	0E+00	3E-05	2.E-05	9.E-12	2.E-06	2.E-07	1.E-09	3.E-07	0.E+00	0.E+00	0.E+00	2.E-05
Pu-238	0	2E-09	2E-11	2E-07	1E-08	2E-10	6E-07	0E+00	0E+00	0E+00	9E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	4E-07	2E-08	3E-10	1E-06	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	3E-08	6E-13	8E-09	2E-10	1E-11	2E-08	0E+00	0E+00	0E+00	6E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	1E-11	3E-16	6E-08	3E-07	5E-08	1E-09	1E-05	1E-04	2E-05	2E-04	3.E-11	8.E-16	2.E-07	9.E-07	1.E-07	4.E-09	3.E-05	3.E-04	6.E-05	4.E-04
Sn-126	6.3	9E-06	6E-15	6E-09	1E-08	2E-09	6E-09	4E-05	5E-05	9E-06	1E-04	5.E-05	4.E-14	4.E-08	8.E-08	1.E-08	4.E-08	3.E-04	3.E-04	5.E-05	7.E-04
Sr-90	4.2	2E-07	7E-14	2E-05	8E-06	3E-06	2E-07	0E+00	0E+00	0E+00	3E-05	9.E-07	3.E-13	8.E-05	3.E-05	1.E-05	7.E-07	0.E+00	0.E+00	0.E+00	1.E-04
Tc-99	0	8E-11	6E-16	1E-06	6E-09	9E-08	6E-10	8E-06	6E-08	1E-06	1E-05	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	3E-07	2E-11	5E-07	4E-08	1E-07	6E-07	0E+00	0E+00	0E+00	1E-06	5.E-07	3.E-11	1.E-06	8.E-08	2.E-07	1.E-06	0.E+00	0.E+00	0.E+00	3.E-06
U-234	0.31	1E-08	2E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	1E-06	4.E-09	5.E-12	2.E-07	1.E-08	3.E-08	2.E-07	0.E+00	0.E+00	0.E+00	4.E-07
U-235	0.0089	2E-05	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	4.E-10	1.E-09	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.21	4E-06	1E-11	6E-07	5E-08	1E-07	7E-07	0E+00	0E+00	0E+00	6E-06	9.E-07	3.E-12	1.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	1.E-06
											Excess Cancer Risk	**1.E-04**	**5.E-11**	**8.E-05**	**4.E-05**	**1.E-05**	**3.E-06**	**3.E-04**	**6.E-04**	**1.E-04**	**1.E-03**

Table D-8-30: Results of Radiological Risk Assessment For EA U at T = 1000 Year

Nuclide	EPC (pCi/g)	T=1000 Year										T=1000 Year									
		RSR (1/(pCi/g)										Risk (unitless)									
		Water Independent Pathways						Water Dependant Pathwa			All Pathways	Water Independent Pathways						Water Dependant Pathways			All Pathways
		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk		Ground	Inhalation	Plant	Meat	Milk	Soil	Plant	Meat	Milk	
Am-241	0	2E-07	4E-12	5E-08	1E-09	8E-11	1E-07	0E+00	0E+00	0E+00	4E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
C-14	1.7	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Co-60	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Cs-137	2.1	3E-15	2E-24	1E-16	2E-16	9E-17	8E-18	0E+00	0E+00	0E+00	4E-15	7.E-15	5.E-24	2.E-16	5.E-16	2.E-16	2.E-17	0.E+00	0.E+00	0.E+00	8.E-15
H-3	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
I-129	0	1E-11	4E-18	6E-10	3E-10	7E-10	8E-11	6E-08	4E-08	1E-07	2E-07	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Ni-63	0	0E+00	1E-18	4E-11	1E-11	7E-11	2E-12	0E+00	0E+00	0E+00	1E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Np-237	0.6	1E-05	8E-12	2E-06	1E-07	1E-09	2E-07	0E+00	0E+00	0E+00	2E-05	8.E-06	5.E-12	1.E-06	8.E-08	8.E-10	1.E-07	0.E+00	0.E+00	0.E+00	1.E-05
Pu-238	0	1E-10	1E-14	3E-10	2E-11	3E-11	4E-10	0E+00	0E+00	0E+00	9E-10	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-239	0	7E-09	3E-11	3E-07	2E-08	3E-10	9E-07	0E+00	0E+00	0E+00	1E-06	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Pu-241	0	7E-09	1E-13	2E-09	4E-11	3E-12	5E-09	0E+00	0E+00	0E+00	1E-08	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Se-79	2.8	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sn-126	6.3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
Sr-90	4.2	1E-17	4E-24	9E-16	4E-16	1E-16	8E-18	0E+00	0E+00	0E+00	1E-15	4.E-17	1.E-23	4.E-15	2.E-15	6.E-16	3.E-17	0.E+00	0.E+00	0.E+00	6.E-15
Tc-99	0	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00	0.E+00
U-233	2.1	4E-06	2E-11	5E-07	4E-08	9E-08	8E-07	0E+00	0E+00	0E+00	5E-06	8.E-06	5.E-11	1.E-06	7.E-08	2.E-07	2.E-06	0.E+00	0.E+00	0.E+00	1.E-05
U-234	0.31	5E-07	1E-11	6E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	2E-06	2.E-07	4.E-12	2.E-07	1.E-08	3.E-08	1.E-07	0.E+00	0.E+00	0.E+00	5.E-07
U-235	0.0089	2E-05	1E-11	6E-07	7E-08	9E-08	5E-07	0E+00	0E+00	0E+00	2E-05	2.E-07	1.E-13	5.E-09	6.E-10	8.E-10	5.E-09	0.E+00	0.E+00	0.E+00	2.E-07
U-238	0.21	3E-06	1E-11	5E-07	4E-08	1E-07	5E-07	0E+00	0E+00	0E+00	5E-06	7.E-07	2.E-12	1.E-07	8.E-09	2.E-08	1.E-07	0.E+00	0.E+00	0.E+00	9.E-07
											Excess Cancer Risk	**2.E-05**	**6.E-11**	**3.E-06**	**2.E-07**	**2.E-07**	**2.E-06**	**0.E+00**	**0.E+00**	**0.E+00**	**2.E-05**

Table D-8-31: Maximum Risk Assessment Results for Yakama Residential Receptor

Exposure Pathways	Exposure Areas									
	A plus B	C	E	F plus G	H plus I	J	L1 plus L2	P	R	U
Carcinogenic Risk - Radiological COPCs										
External Gamma	3.E-03	3.E-03	1.E-03	3.E-04	4.E-04	3.E-04	6.E-04	2.E-03	2.E-06	4.E-04
Inhalation	5.E-10	7.E-12	4.E-11	2.E-09	6.E-07	2.E-09	5.E-08	2.E-06	2.E-08	3.E-10
Fruits, Vegetables and Grains Ingestion	2.E-03	3.E-03	1.E-03	2.E-04	4.E-04	3.E-04	5.E-04	3.E-03	1.E-05	5.E-04
Meat Ingestion	2.E-03	3.E-03	1.E-03	5.E-04	7.E-04	2.E-03	7.E-04	2.E-03	5.E-06	7.E-04
Milk Ingestion	5.E-04	5.E-04	3.E-04	8.E-05	1.E-04	3.E-04	2.E-04	6.E-04	2.E-06	1.E-04
Soil Ingestion	9.E-06	4.E-06	3.E-06	2.E-06	1.E-06	2.E-06	4.E-06	4.E-05	2.E-06	3.E-06
Cumulative ELCR	**8E-03**	**9E-03**	**4E-03**	**1E-03**	**2E-03**	**2E-03**	**2E-03**	**7E-03**	**2E-05**	**2E-03**

OUTPUT RISK ASSESSMENT SUMMARY REPORT FOR YAKAMA NATION RESIDENTIAL RECEPTOR

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RESRAD, Version 6.5      T« Limit = 180 days        11/27/2014  16:08  Page   1
 Intrisk : Residual Dose and Risk Assessment for Yakama Resident
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD
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Table of Contents

Part III: Intake Quantities and Health Risk Factors


```
 Cancer Risk Slope Factors ...............................    2
 Risk Slope and ETFG for the Ground Pathway ..............    6
 Amount of Intake Quantities and Excess Cancer Risks
      Time= 0.000E+00 ....................................    8
      Time= 1.000E+00 ....................................   13
      Time= 3.000E+00 ....................................   18
      Time= 1.000E+01 ....................................   23
      Time= 1.983E+01 ....................................   28
      Time= 3.000E+01 ....................................   33
      Time= 1.000E+02 ....................................   38
      Time= 3.000E+02 ....................................   43
      Time= 1.000E+03 ....................................   48
```

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 2
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Cancer Risk Slope Factors Summary Table
Risk Library: FGR 13 Morbidity

0

Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	1.47E-06	3.48E-10	SLPF(1,1)
Sf-1	Am-241	2.76E-08	2.76E-08	SLPF(2,1)
Sf-1	C-14	7.83E-12	7.83E-12	SLPF(3,1)
Sf-1	Co-60	1.24E-05	1.24E-05	SLPF(4,1)
Sf-1	Cs-137+D	2.55E-06	5.32E-10	SLPF(5,1)
Sf-1	H-3	0.00E+00	0.00E+00	SLPF(6,1)
Sf-1	I-129	6.10E-09	6.10E-09	SLPF(7,1)
Sf-1	Ni-63	0.00E+00	0.00E+00	SLPF(8,1)
Sf-1	Np-237+D	7.97E-07	5.36E-08	SLPF(9,1)
Sf-1	Pa-231	1.39E-07	1.39E-07	SLPF(10,1)
Sf-1	Pb-210+D	4.21E-09	1.41E-09	SLPF(11,1)
Sf-1	Pu-238	7.22E-11	7.22E-11	SLPF(12,1)
Sf-1	Pu-239	2.00E-10	2.00E-10	SLPF(14,1)
Sf-1	Pu-241	4.11E-12	4.11E-12	SLPF(15,1)
Sf-1	Pu-241+D	3.76E-07	4.11E-12	SLPF(16,1)
Sf-1	Ra-226+D	8.49E-06	2.29E-08	SLPF(17,1)
Sf-1	Se-79	1.10E-11	1.10E-11	SLPF(18,1)
Sf-1	Sn-126+D	8.83E-06	9.96E-08	SLPF(19,1)
Sf-1	Sr-90+D	1.96E-08	4.82E-10	SLPF(20,1)
Sf-1	Tc-99	8.14E-11	8.14E-11	SLPF(21,1)
Sf-1	Th-229+D	1.17E-06	2.25E-07	SLPF(22,1)
Sf-1	Th-230	8.19E-10	8.19E-10	SLPF(23,1)
Sf-1	U-233	9.82E-10	9.82E-10	SLPF(24,1)
Sf-1	U-234	2.52E-10	2.52E-10	SLPF(25,1)
Sf-1	U-235+D	5.43E-07	5.18E-07	SLPF(26,1)
Sf-1	U-238	4.99E-11	4.99E-11	SLPF(27,1)
Sf-1	U-238+D	1.14E-07	4.99E-11	SLPF(28,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	2.13E-07	1.49E-07	SLPF(1,2)
Sf-2	Am-241	3.77E-08	3.77E-08	SLPF(2,2)
Sf-2	C-14(p) (Class: S (particulates))	1.69E-11	1.69E-11	SLPF(3,2)
Sf-2	C-14(g) (Class: G (C02))	1.99E-14	1.99E-14	C14GInhSF
Sf-2	Co-60	1.01E-10	1.01E-10	SLPF(4,2)
Sf-2	Cs-137+D	1.12E-10	1.12E-10	SLPF(5,2)
Sf-2	H-3	8.51E-13	8.51E-13	SLPF(6,2)
Sf-2	I-129	1.60E-10	1.60E-10	SLPF(7,2)
Sf-2	Ni-63	5.77E-12	5.77E-12	SLPF(8,2)
Sf-2	Np-237+D	2.87E-08	2.87E-08	SLPF(9,2)
Sf-2	Pa-231	7.62E-08	7.62E-08	SLPF(10,2)
Sf-2	Pb-210+D	3.08E-08	1.58E-08	SLPF(11,2)

Sf-2	Pu-238	5.22E-08	5.22E-08	SLPF(12,2)
Sf-2	Pu-239	5.51E-08	5.51E-08	SLPF(14,2)
Sf-2	Pu-241	8.66E-10	8.66E-10	SLPF(15,2)
Sf-2	Pu-241+D	8.73E-10	8.66E-10	SLPF(16,2)
Sf-2	Ra-226+D	2.83E-08	2.82E-08	SLPF(17,2)
Sf-2	Se-79	1.99E-11	1.99E-11	SLPF(18,2)
Sf-2	Sn-126+D	4.13E-10	4.11E-10	SLPF(19,2)
Sf-2	Sr-90+D	4.33E-10	4.25E-10	SLPF(20,2)

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 3
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-2	Tc-99	3.81E-11	3.81E-11	SLPF(21,2)
Sf-2	Th-229+D	2.30E-07	1.75E-07	SLPF(22,2)
Sf-2	Th-230	3.40E-08	3.40E-08	SLPF(23,2)
Sf-2	U-233	2.83E-08	2.83E-08	SLPF(24,2)
Sf-2	U-234	2.78E-08	2.78E-08	SLPF(25,2)
Sf-2	U-235+D	2.50E-08	2.50E-08	SLPF(26,2)
Sf-2	U-238	2.36E-08	2.36E-08	SLPF(27,2)
Sf-2	U-238+D	2.36E-08	2.36E-08	SLPF(28,2)
Sf-3	Food ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,3)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,3)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,3)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,3)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,3)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,3)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,3)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,3)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,3)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,3)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,3)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,3)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,3)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,3)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,3)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,3)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,3)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,3)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,3)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,3)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,3)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,3)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,3)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,3)
Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,3)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,3)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,3)
Sf-3	Water ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	4.86E-10	2.01E-10	SLPF(1,4)
Sf-3	Am-241	1.04E-10	1.04E-10	SLPF(2,4)
Sf-3	C-14	1.55E-12	1.55E-12	SLPF(3,4)

Sf-3	Co-60	1.57E-11	1.57E-11	SLPF(4,4)
Sf-3	Cs-137+D	3.04E-11	3.04E-11	SLPF(5,4)
Sf-3	H-3	1.12E-13	1.12E-13	SLPF(6,4)
Sf-3	I-129	1.48E-10	1.48E-10	SLPF(7,4)
Sf-3	Ni-63	6.70E-13	6.70E-13	SLPF(8,4)
Sf-3	Np-237+D	6.74E-11	6.18E-11	SLPF(9,4)
Sf-3	Pa-231	1.73E-10	1.73E-10	SLPF(10,4)
Sf-3	Pb-210+D	2.66E-09	8.81E-10	SLPF(11,4)

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 4
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Cancer Risk Slope Factors Summary Table (continued)
Risk Library: FGR 13 Morbidity

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Menu	Parameter	Current Value	Base Case*	Parameter Name
Sf-3	Pu-238	1.31E-10	1.31E-10	SLPF(12,4)
Sf-3	Pu-239	1.35E-10	1.35E-10	SLPF(14,4)
Sf-3	Pu-241	1.76E-12	1.76E-12	SLPF(15,4)
Sf-3	Pu-241+D	6.64E-12	1.76E-12	SLPF(16,4)
Sf-3	Ra-226+D	3.86E-10	3.85E-10	SLPF(17,4)
Sf-3	Se-79	7.29E-12	7.29E-12	SLPF(18,4)
Sf-3	Sn-126+D	2.72E-11	2.56E-11	SLPF(19,4)
Sf-3	Sr-90+D	7.40E-11	5.59E-11	SLPF(20,4)
Sf-3	Tc-99	2.75E-12	2.75E-12	SLPF(21,4)
Sf-3	Th-229+D	5.28E-10	2.24E-10	SLPF(22,4)
Sf-3	Th-230	9.10E-11	9.10E-11	SLPF(23,4)
Sf-3	U-233	7.18E-11	7.18E-11	SLPF(24,4)
Sf-3	U-234	7.07E-11	7.07E-11	SLPF(25,4)
Sf-3	U-235+D	7.18E-11	6.96E-11	SLPF(26,4)
Sf-3	U-238	6.40E-11	6.40E-11	SLPF(27,4)
Sf-3	U-238+D	8.71E-11	6.40E-11	SLPF(28,4)
Sf-3	Soil ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.53E-10	2.45E-10	SLPF(1,5)
Sf-3	Am-241	1.34E-10	1.34E-10	SLPF(2,5)
Sf-3	C-14	2.00E-12	2.00E-12	SLPF(3,5)
Sf-3	Co-60	2.23E-11	2.23E-11	SLPF(4,5)
Sf-3	Cs-137+D	3.74E-11	3.74E-11	SLPF(5,5)
Sf-3	H-3	1.44E-13	1.44E-13	SLPF(6,5)
Sf-3	I-129	3.22E-10	3.22E-10	SLPF(7,5)
Sf-3	Ni-63	9.51E-13	9.51E-13	SLPF(8,5)
Sf-3	Np-237+D	9.10E-11	8.29E-11	SLPF(9,5)
Sf-3	Pa-231	2.26E-10	2.26E-10	SLPF(10,5)
Sf-3	Pb-210+D	3.44E-09	1.18E-09	SLPF(11,5)
Sf-3	Pu-238	1.69E-10	1.69E-10	SLPF(12,5)
Sf-3	Pu-239	1.74E-10	1.74E-10	SLPF(14,5)
Sf-3	Pu-241	2.28E-12	2.28E-12	SLPF(15,5)
Sf-3	Pu-241+D	9.42E-12	2.28E-12	SLPF(16,5)
Sf-3	Ra-226+D	5.15E-10	5.14E-10	SLPF(17,5)
Sf-3	Se-79	9.69E-12	9.69E-12	SLPF(18,5)
Sf-3	Sn-126+D	3.92E-11	3.69E-11	SLPF(19,5)
Sf-3	Sr-90+D	9.53E-11	6.88E-11	SLPF(20,5)
Sf-3	Tc-99	4.00E-12	4.00E-12	SLPF(21,5)
Sf-3	Th-229+D	7.16E-10	2.90E-10	SLPF(22,5)
Sf-3	Th-230	1.19E-10	1.19E-10	SLPF(23,5)
Sf-3	U-233	9.69E-11	9.69E-11	SLPF(24,5)
Sf-3	U-234	9.55E-11	9.55E-11	SLPF(25,5)

Sf-3	U-235+D	9.76E-11	9.44E-11	SLPF(26,5)
Sf-3	U-238	8.66E-11	8.66E-11	SLPF(27,5)
Sf-3	U-238+D	1.21E-10	8.66E-11	SLPF(28,5)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/27/2014  16:08  Page   5
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

                            Cancer Risk Slope Factors Summary Table (continued)
                                      Risk Library: FGR 13 Morbidity
0                                                                      Current     Base      Parameter
  Menu                          Parameter                              Value      Case*       Name
-----------------------------------------------------------------------------------------------------------
Sf-Rn  Bi-214                                                        1.50E-11   1.50E-11   SLPFRN(1,4)

Sf-Rn  Radon K factors, (mrem/WLM):
Sf-Rn  Rn-222 Indoor                                                 7.60E+02   7.60E+02   KFACTR(1,1)
Sf-Rn  Rn-222 Outdoor                                                5.70E+02   5.70E+02   KFACTR(1,2)
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*Base Case means Default.Lib w/o Associate Nuclide contributions.
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RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 6
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	1.983E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-225	4.500E-08	5.315E-01	5.315E-01	5.315E-01	5.315E-01	5.315E-01	5.315E-01	5.315E-01	5.315E-01	5.315E-01
Ac-227	3.480E-10	5.327E-01	5.327E-01	5.327E-01	5.327E-01	5.327E-01	5.327E-01	5.327E-01	5.327E-01	5.327E-01
Am-241	2.760E-08	5.350E-01	5.350E-01	5.350E-01	5.350E-01	5.350E-01	5.350E-01	5.350E-01	5.350E-01	5.350E-01
At-217	1.320E-09	5.186E-01	5.186E-01	5.186E-01	5.186E-01	5.186E-01	5.186E-01	5.186E-01	5.186E-01	5.186E-01
At-218	3.570E-09	5.347E-01	5.347E-01	5.347E-01	5.347E-01	5.347E-01	5.347E-01	5.347E-01	5.347E-01	5.347E-01
Ba-137m	2.690E-06	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01
Bi-210	2.760E-09	5.231E-01	5.231E-01	5.231E-01	5.231E-01	5.231E-01	5.231E-01	5.231E-01	5.231E-01	5.231E-01
Bi-211	1.880E-07	5.233E-01	5.233E-01	5.233E-01	5.233E-01	5.233E-01	5.233E-01	5.233E-01	5.233E-01	5.233E-01
Bi-213	5.650E-07	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01
Bi-214	7.480E-06	5.202E-01	5.202E-01	5.202E-01	5.202E-01	5.202E-01	5.202E-01	5.202E-01	5.202E-01	5.202E-01
C-14	7.830E-12	5.388E-01	5.388E-01	5.388E-01	5.388E-01	5.388E-01	5.388E-01	5.388E-01	5.388E-01	5.388E-01
Co-60	1.240E-05	5.199E-01	5.199E-01	5.199E-01	5.199E-01	5.199E-01	5.199E-01	5.199E-01	5.199E-01	5.199E-01
Cs-137	5.320E-10	5.283E-01	5.283E-01	5.283E-01	5.283E-01	5.283E-01	5.283E-01	5.283E-01	5.283E-01	5.283E-01
Fr-221	1.110E-07	5.281E-01	5.281E-01	5.281E-01	5.281E-01	5.281E-01	5.281E-01	5.281E-01	5.281E-01	5.281E-01
Fr-223	1.400E-07	5.264E-01	5.264E-01	5.264E-01	5.264E-01	5.264E-01	5.264E-01	5.264E-01	5.264E-01	5.264E-01
H-3	0.000E+00	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01
I-129	6.100E-09	5.486E-01	5.486E-01	5.486E-01	5.486E-01	5.486E-01	5.486E-01	5.486E-01	5.486E-01	5.486E-01
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	5.360E-08	5.332E-01	5.332E-01	5.332E-01	5.332E-01	5.332E-01	5.332E-01	5.332E-01	5.332E-01	5.332E-01
Pa-231	1.390E-07	5.236E-01	5.236E-01	5.236E-01	5.236E-01	5.236E-01	5.236E-01	5.236E-01	5.236E-01	5.236E-01
Pa-233	7.430E-07	5.243E-01	5.243E-01	5.243E-01	5.243E-01	5.243E-01	5.243E-01	5.243E-01	5.243E-01	5.243E-01
Pa-234	8.710E-06	5.197E-01	5.197E-01	5.197E-01	5.197E-01	5.197E-01	5.197E-01	5.197E-01	5.197E-01	5.197E-01
Pa-234m	6.870E-08	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01	5.191E-01
Pb-209	5.370E-10	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01
Pb-210	1.410E-09	5.395E-01	5.395E-01	5.395E-01	5.395E-01	5.395E-01	5.395E-01	5.395E-01	5.395E-01	5.395E-01
Pb-211	2.290E-07	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01
Pb-214	9.820E-07	5.232E-01	5.232E-01	5.232E-01	5.232E-01	5.232E-01	5.232E-01	5.232E-01	5.232E-01	5.232E-01
Po-210	3.950E-11	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01
Po-211	3.580E-08	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01
Po-213	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Po-214	3.860E-10	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01
Po-215	7.480E-10	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01
Po-218	4.260E-11	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01
Pu-238	7.220E-11	5.592E-01	5.592E-01	5.592E-01	5.592E-01	5.592E-01	5.592E-01	5.592E-01	5.592E-01	5.592E-01
Pu-239	2.000E-10	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01
Pu-241	4.110E-12	5.331E-01	5.331E-01	5.331E-01	5.331E-01	5.331E-01	5.331E-01	5.331E-01	5.331E-01	5.331E-01
Ra-223	4.340E-07	5.263E-01	5.263E-01	5.263E-01	5.263E-01	5.263E-01	5.263E-01	5.263E-01	5.263E-01	5.263E-01
Ra-225	5.910E-09	5.387E-01	5.387E-01	5.387E-01	5.387E-01	5.387E-01	5.387E-01	5.387E-01	5.387E-01	5.387E-01
Ra-226	2.290E-08	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01	5.302E-01
Rn-219	2.250E-07	5.238E-01	5.238E-01	5.238E-01	5.238E-01	5.238E-01	5.238E-01	5.238E-01	5.238E-01	5.238E-01
Rn-222	1.740E-09	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01
Sb-126	1.280E-05	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01	5.157E-01
Sb-126m	6.940E-06	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01	5.163E-01

Se-79	1.100E-11	5.344E-01	5.344E-01	5.344E-01	5.344E-01	5.344E-01	5.344E-01	5.344E-01	5.344E-01	5.344E-01
Sn-126	9.960E-08	5.338E-01	5.338E-01	5.338E-01	5.338E-01	5.338E-01	5.338E-01	5.338E-01	5.338E-01	5.338E-01
Sr-90	4.820E-10	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01
Tc-99	8.140E-11	5.329E-01	5.329E-01	5.329E-01	5.329E-01	5.329E-01	5.329E-01	5.329E-01	5.329E-01	5.329E-01
Th-227	3.780E-07	5.284E-01	5.284E-01	5.284E-01	5.284E-01	5.284E-01	5.284E-01	5.284E-01	5.284E-01	5.284E-01
Th-229	2.250E-07	5.318E-01	5.318E-01	5.318E-01	5.318E-01	5.318E-01	5.318E-01	5.318E-01	5.318E-01	5.318E-01
Th-230	8.190E-10	5.322E-01	5.322E-01	5.322E-01	5.322E-01	5.322E-01	5.322E-01	5.322E-01	5.322E-01	5.322E-01

RPP-RPT-58329, Rev. 3

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RESRAD, Version 6.5      T« Limit = 180 days        11/27/2014  16:08  Page   7
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD
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Risk Slope and Environmental Transport Factors for the Ground Pathway

0Nuclide (i)	Slope(i)*	ETFG(i,t) At Time in Years (dimensionless) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	1.983E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-231	2.450E-08	5.337E-01	5.337E-01	5.337E-01	5.337E-01	5.337E-01	5.337E-01	5.337E-01	5.337E-01	5.337E-01
Th-234	1.630E-08	5.334E-01	5.334E-01	5.334E-01	5.334E-01	5.334E-01	5.334E-01	5.334E-01	5.334E-01	5.334E-01
Tl-207	1.520E-08	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01
Tl-209	9.830E-06	5.220E-01	5.220E-01	5.220E-01	5.220E-01	5.220E-01	5.220E-01	5.220E-01	5.220E-01	5.220E-01
Tl-210	0.000E+00	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01	5.740E-01
U-233	9.820E-10	5.308E-01	5.308E-01	5.308E-01	5.308E-01	5.308E-01	5.308E-01	5.308E-01	5.308E-01	5.308E-01
U-234	2.520E-10	5.375E-01	5.375E-01	5.375E-01	5.375E-01	5.375E-01	5.375E-01	5.375E-01	5.375E-01	5.375E-01
U-235	5.180E-07	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01	5.300E-01
U-237	3.760E-07	5.303E-01	5.303E-01	5.303E-01	5.303E-01	5.303E-01	5.303E-01	5.303E-01	5.303E-01	5.303E-01
U-238	4.990E-11	5.573E-01	5.573E-01	5.573E-01	5.573E-01	5.573E-01	5.573E-01	5.573E-01	5.573E-01	5.573E-01
Y-90	1.910E-08	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01	5.189E-01

* - Units are 1/yr per (pCi/g) at infinite depth and area. Multiplication by ETFG(i,t) converts to site conditions.

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 8
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 0.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	8.105E-06	3.061E+01	6.867E-01	4.625E-02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.106E+02
C-14	1.179E+02	9.615E+04	7.373E+04	3.711E+04	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.071E+05
Co-60	8.105E-06	2.444E+03	2.871E+03	4.082E+02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.803E+03
Cs-137	8.105E-06	1.222E+03	2.335E+03	8.997E+02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.536E+03
H-3	9.904E+03	2.017E+05	6.238E+04	6.530E+04	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.295E+05
I-129	8.105E-06	6.116E+02	3.150E+02	6.671E+02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.673E+03
Ni-63	8.105E-06	1.528E+03	4.713E+02	2.707E+03	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.786E+03
Np-237	8.105E-06	6.112E+02	4.496E+01	3.332E-01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.357E+02
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	8.105E-06	3.061E+01	1.373E+00	2.312E-02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.113E+02
Pu-239	8.105E-06	3.061E+01	1.373E+00	2.312E-02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.113E+02
Pu-241	8.105E-06	3.061E+01	1.373E+00	2.312E-02	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.113E+02
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Se-79	8.105E-06	3.056E+03	1.764E+04	2.499E+03	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.328E+04
Sn-126	8.105E-06	7.644E+01	1.620E+02	2.656E+01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.443E+02
Sr-90	8.105E-06	9.167E+03	4.041E+03	1.416E+03	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.470E+04
Tc-99	8.105E-06	1.528E+05	8.230E+02	1.147E+04	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.652E+05
Th-229	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	8.105E-06	7.644E+01	5.508E+00	1.594E+01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.772E+02
U-234	8.105E-06	7.644E+01	5.508E+00	1.594E+01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.772E+02
U-235	8.105E-06	7.644E+01	5.508E+00	1.594E+01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.772E+02
U-238	8.105E-06	7.644E+01	5.508E+00	1.594E+01	7.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.772E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 9
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.815E-08	0.0000	4.067E-14	0.0000	1.182E-09	0.0000	1.330E-11	0.0000	8.221E-12	0.0000	1.221E-09	0.0000
Am-241	9.993E-07	0.0017	2.068E-11	0.0000	2.776E-07	0.0005	6.228E-09	0.0000	4.194E-10	0.0000	7.192E-07	0.0012
C-14	2.924E-12	0.0000	1.446E-10	0.0000	1.388E-07	0.0002	1.282E-07	0.0002	6.030E-08	0.0001	1.099E-10	0.0000
Co-60	4.894E-05	0.0845	6.215E-15	0.0000	4.138E-07	0.0007	4.861E-07	0.0008	6.910E-08	0.0001	1.342E-08	0.0000
Cs-137	4.528E-05	0.0782	3.132E-14	0.0000	1.577E-06	0.0027	3.013E-06	0.0052	1.161E-06	0.0020	1.023E-07	0.0002
H-3	0.000E+00	0.0000	7.992E-09	0.0000	2.807E-08	0.0000	1.002E-08	0.0000	9.995E-09	0.0000	1.083E-11	0.0000
I-129	1.701E-07	0.0003	6.593E-14	0.0000	1.001E-05	0.0173	5.164E-06	0.0089	1.093E-05	0.0189	1.298E-06	0.0022
Ni-63	0.000E+00	0.0000	2.540E-15	0.0000	7.892E-08	0.0001	2.435E-08	0.0000	1.399E-07	0.0002	4.096E-09	0.0000
Np-237	2.855E-05	0.0493	1.589E-11	0.0000	3.799E-06	0.0066	2.795E-07	0.0005	2.071E-09	0.0000	4.929E-07	0.0009
Pa-231	3.733E-09	0.0000	3.168E-14	0.0000	3.541E-09	0.0000	1.648E-09	0.0000	2.546E-12	0.0000	9.192E-10	0.0000
Pb-210	1.822E-13	0.0000	2.042E-17	0.0000	8.662E-11	0.0000	6.618E-12	0.0000	3.766E-12	0.0000	2.236E-11	0.0000
Pu-238	2.167E-09	0.0000	2.271E-11	0.0000	2.776E-07	0.0005	1.246E-08	0.0000	2.098E-10	0.0000	7.194E-07	0.0012
Pu-239	7.401E-09	0.0000	3.117E-11	0.0000	3.717E-07	0.0006	1.668E-08	0.0000	2.808E-10	0.0000	9.631E-07	0.0017
Pu-241	1.418E-10	0.0000	1.407E-13	0.0000	1.399E-09	0.0000	6.276E-11	0.0000	1.057E-12	0.0000	3.624E-09	0.0000
Ra-226	9.711E-10	0.0000	5.037E-17	0.0000	1.382E-10	0.0000	8.747E-12	0.0000	1.267E-11	0.0000	8.972E-12	0.0000
Se-79	6.542E-11	0.0000	1.795E-15	0.0000	3.301E-07	0.0006	1.931E-06	0.0033	2.723E-07	0.0005	8.551E-09	0.0000
Sn-126	5.075E-05	0.0876	3.724E-14	0.0000	3.342E-08	0.0001	7.124E-08	0.0001	1.162E-08	0.0000	3.461E-08	0.0001
Sr-90	3.426E-07	0.0006	1.184E-13	0.0000	2.944E-05	0.0508	1.298E-05	0.0224	4.548E-06	0.0079	2.547E-07	0.0004
Tc-99	4.827E-10	0.0000	3.437E-15	0.0000	6.813E-06	0.0118	3.722E-08	0.0001	5.165E-07	0.0009	3.530E-09	0.0000
Th-229	1.402E-07	0.0002	4.278E-13	0.0000	5.038E-09	0.0000	2.271E-10	0.0000	1.923E-11	0.0000	1.304E-08	0.0000
Th-230	9.564E-12	0.0000	6.046E-15	0.0000	7.998E-11	0.0000	3.605E-12	0.0000	3.052E-13	0.0000	2.070E-10	0.0000
U-233	3.621E-08	0.0001	1.594E-11	0.0000	5.146E-07	0.0009	3.708E-08	0.0001	1.073E-07	0.0002	5.338E-07	0.0009
U-234	9.410E-09	0.0000	1.566E-11	0.0000	5.072E-07	0.0009	3.654E-08	0.0001	1.057E-07	0.0002	5.262E-07	0.0009
U-235	1.998E-05	0.0345	1.408E-11	0.0000	5.185E-07	0.0009	3.736E-08	0.0001	1.081E-07	0.0002	5.379E-07	0.0009
U-238	4.115E-06	0.0071	1.331E-11	0.0000	6.405E-07	0.0011	4.615E-08	0.0001	1.335E-07	0.0002	6.645E-07	0.0011
Total	1.993E-04	0.3442	8.287E-09	0.0000	5.578E-05	0.0963	2.432E-05	0.0420	1.817E-05	0.0314	6.895E-06	0.0119

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 10
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.058E-08	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.003E-06	0.0035
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.275E-07	0.0006
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.992E-05	0.0862
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.113E-05	0.0883
H-3	0.000E+00	0.0000	0.000E+00	0.0000	6.193E-09	0.0000	1.034E-09	0.0000	2.028E-09	0.0000	6.534E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-05	0.0476
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.472E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.312E-05	0.0572
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.844E-09	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.195E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-06	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0023
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.228E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-05	0.0200	1.254E-04	0.2165	2.244E-05	0.0388	1.619E-04	0.2797
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.634E-05	0.0800	5.061E-05	0.0874	9.064E-06	0.0157	1.569E-04	0.2710
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.756E-05	0.0821
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.029E-06	0.0139	5.846E-08	0.0001	1.020E-06	0.0018	1.648E-05	0.0285
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.585E-07	0.0003
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.005E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.229E-06	0.0021
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.185E-06	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.118E-05	0.0366
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.600E-06	0.0097
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.599E-05	0.1140	1.760E-04	0.3040	3.252E-05	0.0562	5.791E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 0.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 11
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.762E-07	0.0017	2.020E-11	0.0000	0.000E+00	0.0000	2.711E-07	0.0005	6.084E-09	0.0000	4.096E-10	0.0000	7.023E-07	0.0012
C-14	2.924E-12	0.0000	1.446E-10	0.0000	0.000E+00	0.0000	1.388E-07	0.0002	1.282E-07	0.0002	6.030E-08	0.0001	1.099E-10	0.0000
Co-60	4.894E-05	0.0845	6.215E-15	0.0000	0.000E+00	0.0000	4.138E-07	0.0007	4.861E-07	0.0008	6.910E-08	0.0001	1.342E-08	0.0000
Cs-137	4.528E-05	0.0782	3.132E-14	0.0000	0.000E+00	0.0000	1.577E-06	0.0027	3.013E-06	0.0052	1.161E-06	0.0020	1.023E-07	0.0002
H-3	0.000E+00	0.0000	7.992E-09	0.0000	0.000E+00	0.0000	2.807E-08	0.0000	1.002E-08	0.0000	9.995E-09	0.0000	1.083E-11	0.0000
I-129	1.701E-07	0.0003	6.593E-14	0.0000	0.000E+00	0.0000	1.001E-05	0.0173	5.164E-06	0.0089	1.093E-05	0.0189	1.298E-06	0.0022
Ni-63	0.000E+00	0.0000	2.540E-15	0.0000	0.000E+00	0.0000	7.892E-08	0.0001	2.435E-08	0.0000	1.399E-07	0.0002	4.096E-09	0.0000
Np-237	2.854E-05	0.0493	1.589E-11	0.0000	0.000E+00	0.0000	3.799E-06	0.0066	2.795E-07	0.0005	2.088E-09	0.0000	4.929E-07	0.0009
Pu-238	2.168E-09	0.0000	2.271E-11	0.0000	0.000E+00	0.0000	2.777E-07	0.0005	1.246E-08	0.0000	2.186E-10	0.0000	7.194E-07	0.0012
Pu-239	7.402E-09	0.0000	3.117E-11	0.0000	0.000E+00	0.0000	3.717E-07	0.0006	1.668E-08	0.0000	2.808E-10	0.0000	9.631E-07	0.0017
Pu-241	2.358E-08	0.0000	6.257E-13	0.0000	0.000E+00	0.0000	7.908E-09	0.0000	2.090E-10	0.0000	1.089E-11	0.0000	2.049E-08	0.0000
Se-79	6.542E-11	0.0000	1.795E-15	0.0000	0.000E+00	0.0000	3.301E-07	0.0006	1.931E-06	0.0033	2.723E-07	0.0005	8.551E-09	0.0000
Sn-126	5.075E-05	0.0876	3.724E-14	0.0000	0.000E+00	0.0000	3.342E-08	0.0001	7.124E-08	0.0001	1.162E-08	0.0000	3.461E-08	0.0001
Sr-90	3.426E-07	0.0006	1.184E-13	0.0000	0.000E+00	0.0000	2.944E-05	0.0508	1.298E-05	0.0224	4.548E-06	0.0079	2.547E-07	0.0004
Tc-99	4.827E-10	0.0000	3.437E-15	0.0000	0.000E+00	0.0000	6.813E-06	0.0118	3.722E-08	0.0001	5.165E-07	0.0009	3.530E-09	0.0000
U-233	1.764E-07	0.0003	1.636E-11	0.0000	0.000E+00	0.0000	5.195E-07	0.0009	3.730E-08	0.0001	1.073E-07	0.0002	5.468E-07	0.0009
U-234	1.039E-08	0.0000	1.566E-11	0.0000	0.000E+00	0.0000	5.074E-07	0.0009	3.656E-08	0.0001	1.057E-07	0.0002	5.263E-07	0.0009
U-235	2.000E-05	0.0345	1.415E-11	0.0000	0.000E+00	0.0000	5.232E-07	0.0009	3.902E-08	0.0001	1.081E-07	0.0002	5.401E-07	0.0009
U-238	4.115E-06	0.0071	1.331E-11	0.0000	0.000E+00	0.0000	6.405E-07	0.0011	4.615E-08	0.0001	1.335E-07	0.0002	6.645E-07	0.0011
Total	1.993E-04	0.3442	8.287E-09	0.0000	0.000E+00	0.0000	5.578E-05	0.0963	2.432E-05	0.0420	1.817E-05	0.0314	6.895E-06	0.0119

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 12
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.956E-06	0.0034
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.275E-07	0.0006
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.992E-05	0.0862
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.113E-05	0.0883
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.193E-09	0.0000	1.034E-09	0.0000	2.028E-09	0.0000	6.534E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.757E-05	0.0476
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.472E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.312E-05	0.0572
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-06	0.0017
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0023
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.220E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.161E-05	0.0200	1.254E-04	0.2165	2.244E-05	0.0388	1.619E-04	0.2797
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.634E-05	0.0800	5.061E-05	0.0874	9.064E-06	0.0157	1.569E-04	0.2710
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.756E-05	0.0821
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.029E-06	0.0139	5.846E-08	0.0001	1.020E-06	0.0018	1.648E-05	0.0285
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.387E-06	0.0024
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.186E-06	0.0020
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.121E-05	0.0366
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.600E-06	0.0097
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.599E-05	0.1140	1.760E-04	0.3040	3.252E-05	0.0562	5.791E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 13
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.700E-12	2.857E-05	4.806E-06	2.013E-07	2.642E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.999E-05
Am-241	8.105E-06	3.060E+01	6.867E-01	4.624E-02	7.929E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.106E+02
C-14	2.785E+01	2.379E+04	2.251E+04	1.051E+04	1.873E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.683E+04
Co-60	7.105E-06	2.143E+03	2.517E+03	3.578E+02	6.951E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.087E+03
Cs-137	7.919E-06	1.194E+03	2.281E+03	8.790E+02	7.747E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.432E+03
H-3	3.450E+03	7.177E+04	2.596E+04	2.579E+04	2.763E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.235E+05
I-129	8.027E-06	6.058E+02	3.124E+02	6.612E+02	7.854E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.658E+03
Ni-63	8.044E-06	1.516E+03	4.678E+02	2.687E+03	7.870E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.750E+03
Np-237	8.100E-06	6.107E+02	4.493E+01	3.330E-01	7.924E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.352E+02
Pa-231	1.715E-10	6.363E-03	2.698E-03	5.313E-06	1.677E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.074E-02
Pb-210	1.625E-16	7.192E-09	7.595E-10	3.882E-10	1.589E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.929E-09
Pu-238	8.041E-06	3.036E+01	1.362E+00	2.294E-02	7.867E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.104E+02
Pu-239	8.105E-06	3.060E+01	1.373E+00	2.312E-02	7.929E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.113E+02
Pu-241	7.724E-06	2.917E+01	1.309E+00	2.203E-02	7.557E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.061E+02
Ra-226	1.580E-14	2.288E-06	1.088E-07	1.780E-07	1.546E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.729E-06
Se-79	7.410E-06	2.799E+03	1.638E+04	2.309E+03	7.250E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.156E+04
Sn-126	7.410E-06	7.001E+01	1.492E+02	2.434E+01	7.250E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.161E+02
Sr-90	7.911E-06	8.947E+03	3.945E+03	1.382E+03	7.740E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.435E+04
Tc-99	7.410E-06	1.399E+05	7.645E+02	1.061E+04	7.250E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.514E+05
Th-229	7.653E-10	2.980E-03	1.539E-04	1.521E-05	7.487E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.064E-02
Th-230	7.296E-11	2.841E-04	1.467E-05	1.449E-06	7.138E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.014E-03
U-233	8.104E-06	7.642E+01	5.507E+00	1.593E+01	7.928E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-234	8.104E-06	7.642E+01	5.507E+00	1.593E+01	7.928E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-235	8.104E-06	7.642E+01	5.507E+00	1.593E+01	7.928E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-238	8.104E-06	7.642E+01	5.507E+00	1.593E+01	7.928E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+00 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 14
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.883E-08	0.0000	4.219E-14	0.0000	1.226E-09	0.0000	1.372E-11	0.0000	8.527E-12	0.0000	1.266E-09	0.0000
Am-241	9.981E-07	0.0018	2.066E-11	0.0000	2.772E-07	0.0005	6.220E-09	0.0000	4.189E-10	0.0000	7.183E-07	0.0013
C-14	6.903E-13	0.0000	3.414E-11	0.0000	3.296E-08	0.0001	3.119E-08	0.0001	1.455E-08	0.0000	2.595E-11	0.0000
Co-60	4.290E-05	0.0759	5.448E-15	0.0000	3.627E-07	0.0006	4.261E-07	0.0008	6.057E-08	0.0001	1.177E-08	0.0000
Cs-137	4.424E-05	0.0783	3.060E-14	0.0000	1.541E-06	0.0027	2.943E-06	0.0052	1.134E-06	0.0020	9.996E-08	0.0002
H-3	0.000E+00	0.0000	2.783E-09	0.0000	9.796E-09	0.0000	3.544E-09	0.0000	3.521E-09	0.0000	3.771E-12	0.0000
I-129	1.685E-07	0.0003	6.529E-14	0.0000	9.917E-06	0.0176	5.114E-06	0.0091	1.082E-05	0.0192	1.286E-06	0.0023
Ni-63	0.000E+00	0.0000	2.521E-15	0.0000	7.833E-08	0.0001	2.417E-08	0.0000	1.388E-07	0.0002	4.065E-09	0.0000
Np-237	2.852E-05	0.0505	1.588E-11	0.0000	3.796E-06	0.0067	2.793E-07	0.0005	2.070E-09	0.0000	4.925E-07	0.0009
Pa-231	3.839E-09	0.0000	3.258E-14	0.0000	3.642E-09	0.0000	1.695E-09	0.0000	2.618E-12	0.0000	9.454E-10	0.0000
Pb-210	1.919E-13	0.0000	2.150E-17	0.0000	9.122E-11	0.0000	6.968E-12	0.0000	3.965E-12	0.0000	2.355E-11	0.0000
Pu-238	2.150E-09	0.0000	2.253E-11	0.0000	2.754E-07	0.0005	1.236E-08	0.0000	2.081E-10	0.0000	7.137E-07	0.0013
Pu-239	7.400E-09	0.0000	3.117E-11	0.0000	3.717E-07	0.0007	1.668E-08	0.0000	2.808E-10	0.0000	9.630E-07	0.0017
Pu-241	1.351E-10	0.0000	1.341E-13	0.0000	1.333E-09	0.0000	5.980E-11	0.0000	1.007E-12	0.0000	3.453E-09	0.0000
Ra-226	1.013E-09	0.0000	5.255E-17	0.0000	1.441E-10	0.0000	9.127E-12	0.0000	1.322E-11	0.0000	9.360E-12	0.0000
Se-79	5.980E-11	0.0000	1.641E-15	0.0000	3.018E-07	0.0005	1.766E-06	0.0031	2.489E-07	0.0004	7.817E-09	0.0000
Sn-126	4.639E-05	0.0821	3.404E-14	0.0000	3.055E-08	0.0001	6.513E-08	0.0001	1.062E-08	0.0000	3.164E-08	0.0001
Sr-90	3.344E-07	0.0006	1.155E-13	0.0000	2.873E-05	0.0509	1.267E-05	0.0224	4.439E-06	0.0079	2.486E-07	0.0004
Tc-99	4.413E-10	0.0000	3.142E-15	0.0000	6.229E-06	0.0110	3.403E-08	0.0001	4.723E-07	0.0008	3.227E-09	0.0000
Th-229	1.442E-07	0.0003	4.400E-13	0.0000	5.182E-09	0.0000	2.335E-10	0.0000	1.977E-11	0.0000	1.341E-08	0.0000
Th-230	9.836E-12	0.0000	6.219E-15	0.0000	8.226E-11	0.0000	3.707E-12	0.0000	3.138E-13	0.0000	2.129E-10	0.0000
U-233	3.621E-08	0.0001	1.593E-11	0.0000	5.145E-07	0.0009	3.707E-08	0.0001	1.073E-07	0.0002	5.337E-07	0.0009
U-234	9.408E-09	0.0000	1.565E-11	0.0000	5.071E-07	0.0009	3.654E-08	0.0001	1.057E-07	0.0002	5.261E-07	0.0009
U-235	1.998E-05	0.0354	1.408E-11	0.0000	5.184E-07	0.0009	3.735E-08	0.0001	1.081E-07	0.0002	5.378E-07	0.0010
U-238	4.115E-06	0.0073	1.330E-11	0.0000	6.403E-07	0.0011	4.614E-08	0.0001	1.335E-07	0.0002	6.643E-07	0.0012
Total	1.879E-04	0.3325	2.968E-09	0.0000	5.415E-05	0.0958	2.355E-05	0.0417	1.780E-05	0.0315	6.861E-06	0.0121

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 15
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.134E-08	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.000E-06	0.0035
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.876E-08	0.0001
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.376E-05	0.0774
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-05	0.0884
H-3	0.000E+00	0.0000	0.000E+00	0.0000	6.192E-09	0.0000	1.034E-09	0.0000	2.027E-09	0.0000	2.890E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.731E-05	0.0483
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.309E-05	0.0586
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.259E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-06	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0024
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.982E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.189E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-05	0.0206	1.255E-04	0.2221	2.246E-05	0.0397	1.619E-04	0.2865
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.639E-05	0.0821	5.066E-05	0.0897	9.073E-06	0.0161	1.526E-04	0.2702
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.642E-05	0.0822
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.036E-06	0.0142	5.851E-08	0.0001	1.021E-06	0.0018	1.585E-05	0.0281
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.631E-07	0.0003
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.091E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.229E-06	0.0022
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.185E-06	0.0021
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.118E-05	0.0375
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.599E-06	0.0099
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.604E-05	0.1169	1.762E-04	0.3118	3.255E-05	0.0576	5.650E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+00 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 16
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.746E-07	0.0017	2.016E-11	0.0000	0.000E+00	0.0000	2.706E-07	0.0005	6.074E-09	0.0000	4.089E-10	0.0000	7.011E-07	0.0012
C-14	6.903E-13	0.0000	3.414E-11	0.0000	0.000E+00	0.0000	3.296E-08	0.0001	3.119E-08	0.0001	1.455E-08	0.0000	2.595E-11	0.0000
Co-60	4.290E-05	0.0759	5.448E-15	0.0000	0.000E+00	0.0000	3.627E-07	0.0006	4.261E-07	0.0008	6.057E-08	0.0001	1.177E-08	0.0000
Cs-137	4.424E-05	0.0783	3.060E-14	0.0000	0.000E+00	0.0000	1.541E-06	0.0027	2.943E-06	0.0052	1.134E-06	0.0020	9.996E-08	0.0002
H-3	0.000E+00	0.0000	2.783E-09	0.0000	0.000E+00	0.0000	9.796E-09	0.0000	3.544E-09	0.0000	3.521E-09	0.0000	3.771E-12	0.0000
I-129	1.685E-07	0.0003	6.529E-14	0.0000	0.000E+00	0.0000	9.917E-06	0.0176	5.114E-06	0.0091	1.082E-05	0.0192	1.286E-06	0.0023
Ni-63	0.000E+00	0.0000	2.521E-15	0.0000	0.000E+00	0.0000	7.833E-08	0.0001	2.417E-08	0.0000	1.388E-07	0.0002	4.065E-09	0.0000
Np-237	2.852E-05	0.0505	1.588E-11	0.0000	0.000E+00	0.0000	3.796E-06	0.0067	2.793E-07	0.0005	2.086E-09	0.0000	4.926E-07	0.0009
Pu-238	2.151E-09	0.0000	2.253E-11	0.0000	0.000E+00	0.0000	2.755E-07	0.0005	1.236E-08	0.0000	2.171E-10	0.0000	7.137E-07	0.0013
Pu-239	7.401E-09	0.0000	3.117E-11	0.0000	0.000E+00	0.0000	3.717E-07	0.0007	1.668E-08	0.0000	2.808E-10	0.0000	9.630E-07	0.0017
Pu-241	2.400E-08	0.0000	6.278E-13	0.0000	0.000E+00	0.0000	7.961E-09	0.0000	2.087E-10	0.0000	1.102E-11	0.0000	2.062E-08	0.0000
Se-79	5.980E-11	0.0000	1.641E-15	0.0000	0.000E+00	0.0000	3.018E-07	0.0005	1.766E-06	0.0031	2.489E-07	0.0004	7.817E-09	0.0000
Sn-126	4.639E-05	0.0821	3.404E-14	0.0000	0.000E+00	0.0000	3.055E-08	0.0001	6.513E-08	0.0001	1.062E-08	0.0000	3.164E-08	0.0001
Sr-90	3.344E-07	0.0006	1.155E-13	0.0000	0.000E+00	0.0000	2.873E-05	0.0509	1.267E-05	0.0224	4.439E-06	0.0079	2.486E-07	0.0004
Tc-99	4.413E-10	0.0000	3.142E-15	0.0000	0.000E+00	0.0000	6.229E-06	0.0110	3.403E-08	0.0001	4.723E-07	0.0008	3.227E-09	0.0000
U-233	1.804E-07	0.0003	1.637E-11	0.0000	0.000E+00	0.0000	5.196E-07	0.0009	3.730E-08	0.0001	1.073E-07	0.0002	5.470E-07	0.0010
U-234	1.043E-08	0.0000	1.566E-11	0.0000	0.000E+00	0.0000	5.073E-07	0.0009	3.655E-08	0.0001	1.057E-07	0.0002	5.262E-07	0.0009
U-235	2.000E-05	0.0354	1.415E-11	0.0000	0.000E+00	0.0000	5.233E-07	0.0009	3.906E-08	0.0001	1.081E-07	0.0002	5.400E-07	0.0010
U-238	4.115E-06	0.0073	1.331E-11	0.0000	0.000E+00	0.0000	6.404E-07	0.0011	4.614E-08	0.0001	1.335E-07	0.0002	6.644E-07	0.0012
Total	1.879E-04	0.3325	2.968E-09	0.0000	0.000E+00	0.0000	5.415E-05	0.0958	2.355E-05	0.0417	1.780E-05	0.0315	6.861E-06	0.0121

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 17
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.953E-06	0.0035
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.876E-08	0.0001
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.376E-05	0.0774
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.996E-05	0.0884
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.192E-09	0.0000	1.034E-09	0.0000	2.027E-09	0.0000	2.890E-08	0.0001
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.731E-05	0.0483
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.454E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.309E-05	0.0586
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.004E-06	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0024
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.281E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.162E-05	0.0206	1.255E-04	0.2221	2.246E-05	0.0397	1.619E-04	0.2865
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.639E-05	0.0821	5.066E-05	0.0897	9.073E-06	0.0161	1.526E-04	0.2702
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.642E-05	0.0822
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.036E-06	0.0142	5.851E-08	0.0001	1.021E-06	0.0018	1.585E-05	0.0281
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.392E-06	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.186E-06	0.0021
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.121E-05	0.0375
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.599E-06	0.0099
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.604E-05	0.1169	1.762E-04	0.3118	3.255E-05	0.0576	5.650E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 18
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+00 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.378E-11	2.338E-04	1.617E-05	1.639E-06	2.327E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.843E-04
Am-241	8.101E-06	3.059E+01	6.864E-01	4.622E-02	7.926E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.106E+02
C-14	1.551E+00	1.325E+03	1.254E+03	5.851E+02	1.043E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.165E+03
Co-60	5.460E-06	1.647E+03	1.934E+03	2.749E+02	5.341E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.909E+03
Cs-137	7.558E-06	1.140E+03	2.177E+03	8.389E+02	7.394E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.230E+03
H-3	4.183E+02	8.701E+03	3.148E+03	3.128E+03	3.350E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.498E+04
I-129	7.873E-06	5.942E+02	3.065E+02	6.485E+02	7.703E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.626E+03
Ni-63	7.923E-06	1.493E+03	4.608E+02	2.647E+03	7.752E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.678E+03
Np-237	8.088E-06	6.098E+02	4.487E+01	3.325E-01	7.913E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.342E+02
Pa-231	5.141E-10	1.928E-02	8.728E-03	1.456E-05	5.030E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.306E-02
Pb-210	4.317E-15	1.729E-07	1.588E-08	8.378E-09	4.224E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.394E-07
Pu-238	7.914E-06	2.988E+01	1.341E+00	2.258E-02	7.743E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.087E+02
Pu-239	8.103E-06	3.060E+01	1.373E+00	2.312E-02	7.928E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.113E+02
Pu-241	7.014E-06	2.649E+01	1.189E+00	2.001E-02	6.863E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.632E+01
Ra-226	1.421E-13	2.114E-05	1.228E-06	1.843E-06	1.391E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.560E-05
Se-79	6.193E-06	2.339E+03	1.369E+04	1.929E+03	6.059E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.802E+04
Sn-126	6.193E-06	5.851E+01	1.247E+02	2.035E+01	6.059E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.642E+02
Sr-90	7.537E-06	8.524E+03	3.758E+03	1.317E+03	7.374E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.367E+04
Tc-99	6.193E-06	1.170E+05	6.389E+02	8.867E+03	6.059E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.265E+05
Th-229	2.295E-09	8.757E-03	4.131E-04	3.703E-05	2.246E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.166E-02
Th-230	2.188E-10	8.349E-04	3.939E-05	3.530E-06	2.141E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.019E-03
U-233	8.100E-06	7.639E+01	5.504E+00	1.593E+01	7.925E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-234	8.100E-06	7.639E+01	5.504E+00	1.593E+01	7.925E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-235	8.100E-06	7.639E+01	5.504E+00	1.593E+01	7.925E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02
U-238	8.100E-06	7.639E+01	5.504E+00	1.593E+01	7.925E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.771E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+00 years

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 19
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.022E-08	0.0000	4.531E-14	0.0000	1.316E-09	0.0000	1.457E-11	0.0000	9.157E-12	0.0000	1.360E-09	0.0000
Am-241	9.957E-07	0.0018	2.061E-11	0.0000	2.765E-07	0.0005	6.205E-09	0.0000	4.179E-10	0.0000	7.165E-07	0.0013
C-14	3.840E-14	0.0000	1.899E-12	0.0000	1.834E-09	0.0000	1.735E-09	0.0000	8.099E-10	0.0000	1.444E-12	0.0000
Co-60	3.296E-05	0.0609	4.186E-15	0.0000	2.787E-07	0.0005	3.274E-07	0.0006	4.654E-08	0.0001	9.042E-09	0.0000
Cs-137	4.222E-05	0.0780	2.920E-14	0.0000	1.470E-06	0.0027	2.809E-06	0.0052	1.082E-06	0.0020	9.540E-08	0.0002
H-3	0.000E+00	0.0000	3.372E-10	0.0000	1.187E-09	0.0000	4.294E-10	0.0000	4.266E-10	0.0000	4.569E-13	0.0000
I-129	1.652E-07	0.0003	6.404E-14	0.0000	9.726E-06	0.0180	5.016E-06	0.0093	1.062E-05	0.0196	1.261E-06	0.0023
Ni-63	0.000E+00	0.0000	2.483E-15	0.0000	7.715E-08	0.0001	2.380E-08	0.0000	1.367E-07	0.0003	4.004E-09	0.0000
Np-237	2.848E-05	0.0526	1.586E-11	0.0000	3.790E-06	0.0070	2.789E-07	0.0005	2.067E-09	0.0000	4.918E-07	0.0009
Pa-231	4.051E-09	0.0000	3.438E-14	0.0000	3.843E-09	0.0000	1.789E-09	0.0000	2.762E-12	0.0000	9.976E-10	0.0000
Pb-210	2.124E-13	0.0000	2.380E-17	0.0000	1.009E-10	0.0000	7.708E-12	0.0000	4.387E-12	0.0000	2.606E-11	0.0000
Pu-238	2.116E-09	0.0000	2.218E-11	0.0000	2.711E-07	0.0005	1.216E-08	0.0000	2.048E-10	0.0000	7.024E-07	0.0013
Pu-239	7.399E-09	0.0000	3.116E-11	0.0000	3.716E-07	0.0007	1.667E-08	0.0000	2.807E-10	0.0000	9.628E-07	0.0018
Pu-241	1.227E-10	0.0000	1.217E-13	0.0000	1.210E-09	0.0000	5.431E-11	0.0000	9.144E-13	0.0000	3.136E-09	0.0000
Ra-226	1.101E-09	0.0000	5.709E-17	0.0000	1.566E-10	0.0000	9.917E-12	0.0000	1.436E-11	0.0000	1.017E-11	0.0000
Se-79	4.998E-11	0.0000	1.371E-15	0.0000	2.522E-07	0.0005	1.476E-06	0.0027	2.080E-07	0.0004	6.533E-09	0.0000
Sn-126	3.877E-05	0.0717	2.845E-14	0.0000	2.554E-08	0.0000	5.444E-08	0.0001	8.880E-09	0.0000	2.644E-08	0.0000
Sr-90	3.186E-07	0.0006	1.101E-13	0.0000	2.737E-05	0.0506	1.207E-05	0.0223	4.229E-06	0.0078	2.368E-07	0.0004
Tc-99	3.688E-10	0.0000	2.626E-15	0.0000	5.206E-06	0.0096	2.844E-08	0.0001	3.947E-07	0.0007	2.697E-09	0.0000
Th-229	1.522E-07	0.0003	4.643E-13	0.0000	5.468E-09	0.0000	2.464E-10	0.0000	2.085E-11	0.0000	1.416E-08	0.0000
Th-230	1.038E-11	0.0000	6.563E-15	0.0000	8.681E-11	0.0000	3.911E-12	0.0000	3.310E-13	0.0000	2.247E-10	0.0000
U-233	3.619E-08	0.0001	1.593E-11	0.0000	5.142E-07	0.0010	3.705E-08	0.0001	1.072E-07	0.0002	5.335E-07	0.0010
U-234	9.404E-09	0.0000	1.565E-11	0.0000	5.069E-07	0.0009	3.652E-08	0.0001	1.057E-07	0.0002	5.258E-07	0.0010
U-235	1.997E-05	0.0369	1.407E-11	0.0000	5.182E-07	0.0010	3.734E-08	0.0001	1.080E-07	0.0002	5.376E-07	0.0010
U-238	4.113E-06	0.0076	1.330E-11	0.0000	6.401E-07	0.0012	4.612E-08	0.0001	1.334E-07	0.0002	6.640E-07	0.0012
Total	1.682E-04	0.3110	4.888E-10	0.0000	5.131E-05	0.0948	2.228E-05	0.0412	1.718E-05	0.0318	6.796E-06	0.0126

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 20
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.292E-08	0.0000
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.995E-06	0.0037
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.383E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.362E-05	0.0622
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.768E-05	0.0881
H-3	0.000E+00	0.0000	0.000E+00	0.0000	6.198E-09	0.0000	1.034E-09	0.0000	2.029E-09	0.0000	1.164E-08	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.678E-05	0.0495
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.417E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.305E-05	0.0611
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.068E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.393E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.880E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.524E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.292E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.163E-05	0.0215	1.257E-04	0.2323	2.249E-05	0.0416	1.617E-04	0.2989
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.646E-05	0.0859	5.073E-05	0.0938	9.087E-06	0.0168	1.452E-04	0.2683
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.423E-05	0.0817
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.049E-06	0.0149	5.860E-08	0.0001	1.022E-06	0.0019	1.476E-05	0.0273
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.721E-07	0.0003
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.262E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.228E-06	0.0023
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.184E-06	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.117E-05	0.0391
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.596E-06	0.0103
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.615E-05	0.1223	1.765E-04	0.3262	3.261E-05	0.0603	5.410E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+00 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 21
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.714E-07	0.0018	2.010E-11	0.0000	0.000E+00	0.0000	2.697E-07	0.0005	6.054E-09	0.0000	4.075E-10	0.0000	6.988E-07	0.0013
C-14	3.840E-14	0.0000	1.899E-12	0.0000	0.000E+00	0.0000	1.834E-09	0.0000	1.735E-09	0.0000	8.099E-10	0.0000	1.444E-12	0.0000
Co-60	3.296E-05	0.0609	4.186E-15	0.0000	0.000E+00	0.0000	2.787E-07	0.0005	3.274E-07	0.0006	4.654E-08	0.0001	9.042E-09	0.0000
Cs-137	4.222E-05	0.0780	2.920E-14	0.0000	0.000E+00	0.0000	1.470E-06	0.0027	2.809E-06	0.0052	1.082E-06	0.0020	9.540E-08	0.0002
H-3	0.000E+00	0.0000	3.372E-10	0.0000	0.000E+00	0.0000	1.187E-09	0.0000	4.294E-10	0.0000	4.266E-10	0.0000	4.569E-13	0.0000
I-129	1.652E-07	0.0003	6.404E-14	0.0000	0.000E+00	0.0000	9.726E-06	0.0180	5.016E-06	0.0093	1.062E-05	0.0196	1.261E-06	0.0023
Ni-63	0.000E+00	0.0000	2.483E-15	0.0000	0.000E+00	0.0000	7.715E-08	0.0001	2.380E-08	0.0000	1.367E-07	0.0003	4.004E-09	0.0000
Np-237	2.848E-05	0.0526	1.586E-11	0.0000	0.000E+00	0.0000	3.790E-06	0.0070	2.789E-07	0.0005	2.084E-09	0.0000	4.919E-07	0.0009
Pu-238	2.117E-09	0.0000	2.218E-11	0.0000	0.000E+00	0.0000	2.711E-07	0.0005	1.217E-08	0.0000	2.143E-10	0.0000	7.024E-07	0.0013
Pu-239	7.400E-09	0.0000	3.116E-11	0.0000	0.000E+00	0.0000	3.716E-07	0.0007	1.667E-08	0.0000	2.808E-10	0.0000	9.628E-07	0.0018
Pu-241	2.477E-08	0.0000	6.317E-13	0.0000	0.000E+00	0.0000	8.055E-09	0.0000	2.081E-10	0.0000	1.126E-11	0.0000	2.087E-08	0.0000
Se-79	4.998E-11	0.0000	1.371E-15	0.0000	0.000E+00	0.0000	2.522E-07	0.0005	1.476E-06	0.0027	2.080E-07	0.0004	6.533E-09	0.0000
Sn-126	3.877E-05	0.0717	2.845E-14	0.0000	0.000E+00	0.0000	2.554E-08	0.0000	5.444E-08	0.0001	8.880E-09	0.0000	2.644E-08	0.0000
Sr-90	3.186E-07	0.0006	1.101E-13	0.0000	0.000E+00	0.0000	2.737E-05	0.0506	1.207E-05	0.0223	4.229E-06	0.0078	2.368E-07	0.0004
Tc-99	3.688E-10	0.0000	2.626E-15	0.0000	0.000E+00	0.0000	5.206E-06	0.0096	2.844E-08	0.0001	3.947E-07	0.0007	2.697E-09	0.0000
U-233	1.884E-07	0.0003	1.639E-11	0.0000	0.000E+00	0.0000	5.196E-07	0.0010	3.729E-08	0.0001	1.072E-07	0.0002	5.476E-07	0.0010
U-234	1.051E-08	0.0000	1.565E-11	0.0000	0.000E+00	0.0000	5.071E-07	0.0009	3.654E-08	0.0001	1.057E-07	0.0002	5.260E-07	0.0010
U-235	1.999E-05	0.0370	1.415E-11	0.0000	0.000E+00	0.0000	5.233E-07	0.0010	3.914E-08	0.0001	1.080E-07	0.0002	5.399E-07	0.0010
U-238	4.113E-06	0.0076	1.330E-11	0.0000	0.000E+00	0.0000	6.401E-07	0.0012	4.612E-08	0.0001	1.334E-07	0.0002	6.641E-07	0.0012
Total	1.682E-04	0.3110	4.888E-10	0.0000	0.000E+00	0.0000	5.131E-05	0.0948	2.228E-05	0.0412	1.718E-05	0.0318	6.796E-06	0.0126

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 22
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.946E-06	0.0036
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.383E-09	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.362E-05	0.0622
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.768E-05	0.0881
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.198E-09	0.0000	1.034E-09	0.0000	2.029E-09	0.0000	1.164E-08	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.678E-05	0.0495
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.417E-07	0.0004
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.305E-05	0.0611
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.881E-07	0.0018
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.359E-06	0.0025
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.391E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.163E-05	0.0215	1.257E-04	0.2323	2.249E-05	0.0416	1.617E-04	0.2989
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.646E-05	0.0859	5.073E-05	0.0938	9.087E-06	0.0168	1.452E-04	0.2683
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.423E-05	0.0817
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.049E-06	0.0149	5.860E-08	0.0001	1.022E-06	0.0019	1.476E-05	0.0273
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-06	0.0026
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.186E-06	0.0022
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.120E-05	0.0392
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.597E-06	0.0103
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.615E-05	0.1223	1.765E-04	0.3262	3.261E-05	0.0603	5.410E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 23
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	2.454E-10	2.346E-03	6.177E-05	1.636E-05	2.401E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.825E-03
Am-241	8.074E-06	3.049E+01	6.841E-01	4.607E-02	7.900E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.102E+02
C-14	6.193E-05	5.293E-02	5.012E-02	2.338E-02	4.166E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.265E-01
Co-60	2.171E-06	6.548E+02	7.693E+02	1.094E+02	2.124E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.555E+03
Cs-137	6.419E-06	9.680E+02	1.849E+03	7.126E+02	6.280E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.593E+03
H-3	2.564E-01	5.332E+00	1.930E+00	1.917E+00	2.053E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.182E+00
I-129	7.357E-06	5.553E+02	2.864E+02	6.060E+02	7.198E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.520E+03
Ni-63	7.514E-06	1.416E+03	4.370E+02	2.510E+03	7.351E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.437E+03
Np-237	8.047E-06	6.068E+02	4.464E+01	3.309E-01	7.873E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.305E+02
Pa-231	1.711E-09	6.441E-02	2.979E-02	4.685E-05	1.674E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.110E-01
Pb-210	1.514E-13	5.824E-06	4.719E-07	2.616E-07	1.482E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.039E-06
Pu-238	7.486E-06	2.827E+01	1.268E+00	2.135E-02	7.324E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.028E+02
Pu-239	8.099E-06	3.058E+01	1.372E+00	2.310E-02	7.923E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.112E+02
Pu-241	5.006E-06	1.890E+01	8.482E-01	1.428E-02	4.898E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.874E+01
Ra-226	1.576E-12	2.367E-04	1.467E-05	2.143E-05	1.542E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.882E-04
Se-79	3.305E-06	1.248E+03	7.306E+03	1.030E+03	3.234E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.616E+03
Sn-126	3.306E-06	3.123E+01	6.657E+01	1.086E+01	3.234E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.410E+02
Sr-90	6.361E-06	7.194E+03	3.172E+03	1.111E+03	6.223E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.154E+04
Tc-99	3.306E-06	6.242E+04	3.410E+02	4.733E+03	3.234E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.753E+04
Th-229	7.642E-09	2.895E-02	1.319E-03	1.133E-04	7.477E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.051E-01
Th-230	7.288E-10	2.761E-03	1.258E-04	1.080E-05	7.131E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.003E-02
U-233	8.088E-06	7.627E+01	5.496E+00	1.590E+01	7.913E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.768E+02
U-234	8.088E-06	7.628E+01	5.496E+00	1.590E+01	7.913E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.768E+02
U-235	8.088E-06	7.627E+01	5.496E+00	1.590E+01	7.913E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.768E+02
U-238	8.088E-06	7.627E+01	5.496E+00	1.590E+01	7.913E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.768E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 24
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.548E-08	0.0001	5.709E-14	0.0000	1.658E-09	0.0000	1.767E-11	0.0000	1.153E-11	0.0000	1.713E-09	0.0000
Am-241	9.866E-07	0.0020	2.042E-11	0.0000	2.740E-07	0.0006	6.148E-09	0.0000	4.141E-10	0.0000	7.100E-07	0.0015
C-14	1.529E-18	0.0000	7.563E-17	0.0000	7.304E-14	0.0000	6.916E-14	0.0000	3.227E-14	0.0000	5.749E-17	0.0000
Co-60	1.311E-05	0.0271	1.665E-15	0.0000	1.109E-07	0.0002	1.302E-07	0.0003	1.851E-08	0.0000	3.596E-09	0.0000
Cs-137	3.586E-05	0.0741	2.480E-14	0.0000	1.249E-06	0.0026	2.386E-06	0.0049	9.194E-07	0.0019	8.103E-08	0.0002
H-3	0.000E+00	0.0000	2.061E-13	0.0000	7.254E-13	0.0000	2.626E-13	0.0000	2.608E-13	0.0000	2.793E-16	0.0000
I-129	1.544E-07	0.0003	5.984E-14	0.0000	9.089E-06	0.0188	4.687E-06	0.0097	9.920E-06	0.0205	1.178E-06	0.0024
Ni-63	0.000E+00	0.0000	2.355E-15	0.0000	7.316E-08	0.0002	2.257E-08	0.0000	1.297E-07	0.0003	3.797E-09	0.0000
Np-237	2.834E-05	0.0586	1.578E-11	0.0000	3.771E-06	0.0078	2.775E-07	0.0006	2.056E-09	0.0000	4.893E-07	0.0010
Pa-231	4.791E-09	0.0000	4.066E-14	0.0000	4.545E-09	0.0000	2.117E-09	0.0000	3.265E-12	0.0000	1.180E-09	0.0000
Pb-210	2.961E-13	0.0000	3.318E-17	0.0000	1.407E-10	0.0000	1.073E-11	0.0000	6.110E-12	0.0000	3.634E-11	0.0000
Pu-238	2.001E-09	0.0000	2.097E-11	0.0000	2.564E-07	0.0005	1.151E-08	0.0000	1.937E-10	0.0000	6.644E-07	0.0014
Pu-239	7.395E-09	0.0000	3.115E-11	0.0000	3.714E-07	0.0008	1.667E-08	0.0000	2.806E-10	0.0000	9.623E-07	0.0020
Pu-241	8.758E-11	0.0000	8.688E-14	0.0000	8.637E-10	0.0000	3.876E-11	0.0000	6.526E-13	0.0000	2.238E-09	0.0000
Ra-226	1.444E-09	0.0000	7.488E-17	0.0000	2.054E-10	0.0000	1.302E-11	0.0000	1.885E-11	0.0000	1.334E-11	0.0000
Se-79	2.668E-11	0.0000	7.320E-16	0.0000	1.346E-07	0.0003	7.878E-07	0.0016	1.110E-07	0.0002	3.487E-09	0.0000
Sn-126	2.069E-05	0.0428	1.519E-14	0.0000	1.363E-08	0.0000	2.905E-08	0.0001	4.739E-09	0.0000	1.411E-08	0.0000
Sr-90	2.689E-07	0.0006	9.290E-14	0.0000	2.310E-05	0.0477	1.019E-05	0.0210	3.569E-06	0.0074	1.999E-07	0.0004
Tc-99	1.969E-10	0.0000	1.402E-15	0.0000	2.779E-06	0.0057	1.518E-08	0.0000	2.107E-07	0.0004	1.440E-09	0.0000
Th-229	1.801E-07	0.0004	5.494E-13	0.0000	6.469E-09	0.0000	2.913E-10	0.0000	2.463E-11	0.0000	1.675E-08	0.0000
Th-230	1.229E-11	0.0000	7.768E-15	0.0000	1.027E-10	0.0000	4.625E-12	0.0000	3.912E-13	0.0000	2.660E-10	0.0000
U-233	3.614E-08	0.0001	1.590E-11	0.0000	5.135E-07	0.0011	3.700E-08	0.0001	1.070E-07	0.0002	5.327E-07	0.0011
U-234	9.390E-09	0.0000	1.562E-11	0.0000	5.061E-07	0.0010	3.647E-08	0.0001	1.055E-07	0.0002	5.250E-07	0.0011
U-235	1.994E-05	0.0412	1.405E-11	0.0000	5.174E-07	0.0011	3.728E-08	0.0001	1.079E-07	0.0002	5.367E-07	0.0011
U-238	4.107E-06	0.0085	1.328E-11	0.0000	6.391E-07	0.0013	4.605E-08	0.0001	1.332E-07	0.0003	6.630E-07	0.0014
Total	1.237E-04	0.2556	1.483E-10	0.0000	4.341E-05	0.0897	1.871E-05	0.0387	1.534E-05	0.0317	6.591E-06	0.0136

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 25
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.888E-08	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E-06	0.0041
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-05	0.0276
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.050E-05	0.0837
H-3	0.000E+00	0.0000	0.000E+00	0.0000	6.196E-09	0.0000	1.034E-09	0.0000	2.028E-09	0.0000	9.259E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-05	0.0517
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.292E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.288E-05	0.0679
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.264E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.942E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.345E-07	0.0019
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.358E-06	0.0028
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.229E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.694E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.168E-05	0.0241	1.261E-04	0.2606	2.258E-05	0.0466	1.614E-04	0.3335
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.663E-05	0.0963	5.092E-05	0.1052	9.120E-06	0.0188	1.274E-04	0.2633
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.733E-05	0.0771
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.078E-06	0.0167	5.881E-08	0.0001	1.026E-06	0.0021	1.217E-05	0.0251
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.036E-07	0.0004
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.860E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-06	0.0025
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-06	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.114E-05	0.0437
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.588E-06	0.0115
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.639E-05	0.1372	1.771E-04	0.3659	3.273E-05	0.0676	4.840E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+01 years
0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 26
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.602E-07	0.0020	1.986E-11	0.0000	0.000E+00	0.0000	2.666E-07	0.0006	5.985E-09	0.0000	4.029E-10	0.0000	6.908E-07	0.0014
C-14	1.529E-18	0.0000	7.563E-17	0.0000	0.000E+00	0.0000	7.304E-14	0.0000	6.916E-14	0.0000	3.227E-14	0.0000	5.749E-17	0.0000
Co-60	1.311E-05	0.0271	1.665E-15	0.0000	0.000E+00	0.0000	1.109E-07	0.0002	1.302E-07	0.0003	1.851E-08	0.0000	3.596E-09	0.0000
Cs-137	3.586E-05	0.0741	2.480E-14	0.0000	0.000E+00	0.0000	1.249E-06	0.0026	2.386E-06	0.0049	9.194E-07	0.0019	8.103E-08	0.0002
H-3	0.000E+00	0.0000	2.061E-13	0.0000	0.000E+00	0.0000	7.254E-13	0.0000	2.626E-13	0.0000	2.608E-13	0.0000	2.793E-16	0.0000
I-129	1.544E-07	0.0003	5.984E-14	0.0000	0.000E+00	0.0000	9.089E-06	0.0188	4.687E-06	0.0097	9.920E-06	0.0205	1.178E-06	0.0024
Ni-63	0.000E+00	0.0000	2.355E-15	0.0000	0.000E+00	0.0000	7.316E-08	0.0002	2.257E-08	0.0000	1.297E-07	0.0003	3.797E-09	0.0000
Np-237	2.834E-05	0.0586	1.578E-11	0.0000	0.000E+00	0.0000	3.771E-06	0.0078	2.775E-07	0.0006	2.077E-09	0.0000	4.894E-07	0.0010
Pu-238	2.003E-09	0.0000	2.098E-11	0.0000	0.000E+00	0.0000	2.565E-07	0.0005	1.151E-08	0.0000	2.047E-10	0.0000	6.644E-07	0.0014
Pu-239	7.396E-09	0.0000	3.115E-11	0.0000	0.000E+00	0.0000	3.714E-07	0.0008	1.667E-08	0.0000	2.806E-10	0.0000	9.623E-07	0.0020
Pu-241	2.688E-08	0.0001	6.411E-13	0.0000	0.000E+00	0.0000	8.304E-09	0.0000	2.058E-10	0.0000	1.189E-11	0.0000	2.151E-08	0.0000
Se-79	2.668E-11	0.0000	7.320E-16	0.0000	0.000E+00	0.0000	1.346E-07	0.0003	7.878E-07	0.0016	1.110E-07	0.0002	3.487E-09	0.0000
Sn-126	2.069E-05	0.0428	1.519E-14	0.0000	0.000E+00	0.0000	1.363E-08	0.0000	2.905E-08	0.0001	4.739E-09	0.0000	1.411E-08	0.0000
Sr-90	2.689E-07	0.0006	9.290E-14	0.0000	0.000E+00	0.0000	2.310E-05	0.0477	1.019E-05	0.0210	3.569E-06	0.0074	1.999E-07	0.0004
Tc-99	1.969E-10	0.0000	1.402E-15	0.0000	0.000E+00	0.0000	2.779E-06	0.0057	1.518E-08	0.0000	2.107E-07	0.0004	1.440E-09	0.0000
U-233	2.162E-07	0.0004	1.645E-11	0.0000	0.000E+00	0.0000	5.198E-07	0.0011	3.728E-08	0.0001	1.070E-07	0.0002	5.493E-07	0.0011
U-234	1.084E-08	0.0000	1.563E-11	0.0000	0.000E+00	0.0000	5.064E-07	0.0010	3.649E-08	0.0001	1.055E-07	0.0002	5.252E-07	0.0011
U-235	1.997E-05	0.0413	1.415E-11	0.0000	0.000E+00	0.0000	5.236E-07	0.0011	3.941E-08	0.0001	1.079E-07	0.0002	5.396E-07	0.0011
U-238	4.107E-06	0.0085	1.328E-11	0.0000	0.000E+00	0.0000	6.392E-07	0.0013	4.605E-08	0.0001	1.332E-07	0.0003	6.631E-07	0.0014
Total	1.237E-04	0.2556	1.483E-10	0.0000	0.000E+00	0.0000	4.341E-05	0.0897	1.871E-05	0.0387	1.534E-05	0.0317	6.591E-06	0.0136

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 27
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.924E-06	0.0040
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-13	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.337E-05	0.0276
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.050E-05	0.0837
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.196E-09	0.0000	1.034E-09	0.0000	2.028E-09	0.0000	9.259E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.503E-05	0.0517
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.292E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.288E-05	0.0679
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.346E-07	0.0019
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.358E-06	0.0028
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.691E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.168E-05	0.0241	1.261E-04	0.2606	2.258E-05	0.0466	1.614E-04	0.3335
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.663E-05	0.0963	5.092E-05	0.1052	9.120E-06	0.0188	1.274E-04	0.2633
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.733E-05	0.0771
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.078E-06	0.0167	5.881E-08	0.0001	1.026E-06	0.0021	1.217E-05	0.0251
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.430E-06	0.0030
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.185E-06	0.0024
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.118E-05	0.0438
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.588E-06	0.0115
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.639E-05	0.1372	1.771E-04	0.3659	3.273E-05	0.0676	4.840E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 28
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.983E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	8.736E-10	8.302E-03	1.383E-04	5.780E-05	8.547E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.704E-02
Am-241	8.006E-06	3.023E+01	6.783E-01	4.568E-02	7.833E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.093E+02
C-14	3.912E-11	3.343E-08	3.169E-08	1.478E-08	2.631E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.993E-08
Co-60	5.949E-07	1.794E+02	2.107E+02	2.996E+01	5.820E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.259E+02
Cs-137	5.104E-06	7.697E+02	1.470E+03	5.666E+02	4.994E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.857E+03
H-3	7.639E-06	1.589E-04	5.755E-05	5.716E-05	6.117E-08	0.000E+00	0.000E+00	2.131E+04	3.460E+03	6.928E+03	3.170E+04
I-129	6.689E-06	5.048E+02	2.604E+02	5.510E+02	6.544E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.382E+03
Ni-63	6.974E-06	1.315E+03	4.056E+02	2.330E+03	6.823E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.118E+03
Np-237	7.991E-06	6.025E+02	4.433E+01	3.285E-01	7.818E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.254E+02
Pa-231	3.386E-09	1.275E-01	5.926E-02	9.203E-05	3.312E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.200E-01
Pb-210	1.097E-12	4.181E-05	3.271E-06	1.842E-06	1.073E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.766E-05
Pu-238	6.923E-06	2.614E+01	1.173E+00	1.975E-02	6.773E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.506E+01
Pu-239	8.092E-06	3.056E+01	1.371E+00	2.308E-02	7.917E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.111E+02
Pu-241	3.117E-06	1.177E+01	5.282E-01	8.893E-03	3.050E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.280E+01
Ra-226	6.182E-12	9.302E-04	5.843E-05	8.490E-05	6.048E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.134E-03
Se-79	1.369E-06	5.169E+02	3.025E+03	4.264E+02	1.339E+01	0.000E+00	0.000E+00	1.004E+05	9.861E+05	1.852E+05	1.276E+06
Sn-126	1.369E-06	1.293E+01	2.757E+01	4.497E+00	1.339E+01	0.000E+00	0.000E+00	9.908E+04	9.837E+04	1.848E+04	2.160E+05
Sr-90	5.013E-06	5.669E+03	2.499E+03	8.758E+02	4.904E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.093E+03
Tc-99	1.369E-06	2.585E+04	1.412E+02	1.960E+03	1.339E+01	0.000E+00	0.000E+00	1.680E+05	1.113E+03	2.034E+04	2.174E+05
Th-229	1.513E-08	5.723E-02	2.588E-03	2.201E-04	1.480E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.081E-01
Th-230	1.444E-09	5.460E-03	2.469E-04	2.100E-05	1.412E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.985E-02
U-233	8.071E-06	7.611E+01	5.484E+00	1.587E+01	7.896E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E+02
U-234	8.071E-06	7.611E+01	5.484E+00	1.587E+01	7.896E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E+02
U-235	8.071E-06	7.611E+01	5.484E+00	1.587E+01	7.896E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E+02
U-238	8.071E-06	7.611E+01	5.484E+00	1.587E+01	7.896E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.983E+01 years

0	Radionuclides							
Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 29
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.983E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.367E-08	0.0001	7.544E-14	0.0000	2.190E-09	0.0000	2.223E-11	0.0000	1.523E-11	0.0000	2.264E-09	0.0000
Am-241	9.729E-07	0.0023	2.013E-11	0.0000	2.702E-07	0.0006	6.063E-09	0.0000	4.083E-10	0.0000	7.002E-07	0.0016
C-14	9.618E-25	0.0000	4.756E-23	0.0000	4.594E-20	0.0000	4.354E-20	0.0000	2.031E-20	0.0000	3.615E-23	0.0000
Co-60	3.591E-06	0.0085	4.561E-16	0.0000	3.037E-08	0.0001	3.568E-08	0.0001	5.071E-09	0.0000	9.852E-10	0.0000
Cs-137	2.852E-05	0.0671	1.972E-14	0.0000	9.931E-07	0.0023	1.897E-06	0.0045	7.310E-07	0.0017	6.443E-08	0.0002
H-3	0.000E+00	0.0000	6.119E-18	0.0000	2.154E-17	0.0000	7.801E-18	0.0000	7.748E-18	0.0000	8.291E-21	0.0000
I-129	1.404E-07	0.0003	5.440E-14	0.0000	8.263E-06	0.0194	4.262E-06	0.0100	9.019E-06	0.0212	1.071E-06	0.0025
Ni-63	0.000E+00	0.0000	2.186E-15	0.0000	6.791E-08	0.0002	2.095E-08	0.0000	1.203E-07	0.0003	3.525E-09	0.0000
Np-237	2.814E-05	0.0662	1.566E-11	0.0000	3.745E-06	0.0088	2.755E-07	0.0006	2.042E-09	0.0000	4.859E-07	0.0011
Pa-231	5.827E-09	0.0000	4.945E-14	0.0000	5.528E-09	0.0000	2.576E-09	0.0000	3.968E-12	0.0000	1.435E-09	0.0000
Pb-210	4.483E-13	0.0000	5.022E-17	0.0000	2.129E-10	0.0000	1.621E-11	0.0000	9.239E-12	0.0000	5.501E-11	0.0000
Pu-238	1.851E-09	0.0000	1.940E-11	0.0000	2.371E-07	0.0006	1.064E-08	0.0000	1.791E-10	0.0000	6.144E-07	0.0014
Pu-239	7.389E-09	0.0000	3.112E-11	0.0000	3.711E-07	0.0009	1.665E-08	0.0000	2.804E-10	0.0000	9.615E-07	0.0023
Pu-241	5.453E-11	0.0000	5.410E-14	0.0000	5.378E-10	0.0000	2.413E-11	0.0000	4.063E-13	0.0000	1.394E-09	0.0000
Ra-226	2.022E-09	0.0000	1.049E-16	0.0000	2.877E-10	0.0000	1.824E-11	0.0000	2.640E-11	0.0000	1.868E-11	0.0000
Se-79	1.105E-11	0.0000	3.031E-16	0.0000	5.574E-08	0.0001	3.262E-07	0.0008	4.598E-08	0.0001	1.444E-09	0.0000
Sn-126	8.569E-06	0.0202	6.288E-15	0.0000	5.644E-09	0.0000	1.203E-08	0.0000	1.963E-09	0.0000	5.844E-09	0.0000
Sr-90	2.119E-07	0.0005	7.321E-14	0.0000	1.820E-05	0.0428	8.026E-06	0.0189	2.813E-06	0.0066	1.575E-07	0.0004
Tc-99	8.152E-11	0.0000	5.804E-16	0.0000	1.151E-06	0.0027	6.286E-09	0.0000	8.724E-08	0.0002	5.962E-10	0.0000
Th-229	2.191E-07	0.0005	6.685E-13	0.0000	7.871E-09	0.0000	3.542E-10	0.0000	2.993E-11	0.0000	2.038E-08	0.0000
Th-230	1.496E-11	0.0000	9.456E-15	0.0000	1.250E-10	0.0000	5.626E-12	0.0000	4.754E-13	0.0000	3.238E-10	0.0000
U-233	3.606E-08	0.0001	1.587E-11	0.0000	5.124E-07	0.0012	3.692E-08	0.0001	1.068E-07	0.0003	5.315E-07	0.0013
U-234	9.370E-09	0.0000	1.559E-11	0.0000	5.050E-07	0.0012	3.639E-08	0.0001	1.053E-07	0.0002	5.239E-07	0.0012
U-235	1.990E-05	0.0468	1.402E-11	0.0000	5.163E-07	0.0012	3.720E-08	0.0001	1.076E-07	0.0003	5.356E-07	0.0013
U-238	4.098E-06	0.0096	1.325E-11	0.0000	6.377E-07	0.0015	4.595E-08	0.0001	1.330E-07	0.0003	6.616E-07	0.0016
Total	9.445E-05	0.2222	1.461E-10	0.0000	3.558E-05	0.0837	1.505E-05	0.0354	1.328E-05	0.0312	6.346E-06	0.0149

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 30
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.983E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.816E-08	0.0001
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.950E-06	0.0046
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-19	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.664E-06	0.0086
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-05	0.0758
H-3	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-09	0.0000	5.599E-10	0.0000	1.007E-09	0.0000	4.547E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.276E-05	0.0535
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.127E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.265E-05	0.0768
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-08	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.938E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.642E-07	0.0020
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-06	0.0032
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.011E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.373E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.090E-05	0.0256	1.193E-04	0.2807	2.122E-05	0.0499	1.519E-04	0.3573
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	4.353E-05	0.1024	4.817E-05	0.1133	8.571E-06	0.0202	1.089E-04	0.2562
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.941E-05	0.0692
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	7.543E-06	0.0177	5.564E-08	0.0001	9.646E-07	0.0023	9.808E-06	0.0231
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.478E-07	0.0006
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.699E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.224E-06	0.0029
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.180E-06	0.0028
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.109E-05	0.0496
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.576E-06	0.0131
Total	0.000E+00	0.0000	0.000E+00	0.0000	6.197E-05	0.1458	1.675E-04	0.3942	3.075E-05	0.0724	4.250E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.983E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 31
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.983E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.448E-07	0.0022	1.954E-11	0.0000	0.000E+00	0.0000	2.623E-07	0.0006	5.889E-09	0.0000	3.963E-10	0.0000	6.796E-07	0.0016
C-14	9.618E-25	0.0000	4.756E-23	0.0000	0.000E+00	0.0000	4.594E-20	0.0000	4.354E-20	0.0000	2.031E-20	0.0000	3.615E-23	0.0000
Co-60	3.591E-06	0.0085	4.561E-16	0.0000	0.000E+00	0.0000	3.037E-08	0.0001	3.568E-08	0.0001	5.071E-09	0.0000	9.852E-10	0.0000
Cs-137	2.852E-05	0.0671	1.972E-14	0.0000	0.000E+00	0.0000	9.931E-07	0.0023	1.897E-06	0.0045	7.310E-07	0.0017	6.443E-08	0.0002
H-3	0.000E+00	0.0000	6.119E-18	0.0000	0.000E+00	0.0000	2.154E-17	0.0000	7.801E-18	0.0000	7.748E-18	0.0000	8.291E-21	0.0000
I-129	1.404E-07	0.0003	5.440E-14	0.0000	0.000E+00	0.0000	8.263E-06	0.0194	4.262E-06	0.0100	9.019E-06	0.0212	1.071E-06	0.0025
Ni-63	0.000E+00	0.0000	2.186E-15	0.0000	0.000E+00	0.0000	6.791E-08	0.0002	2.095E-08	0.0000	1.203E-07	0.0003	3.525E-09	0.0000
Np-237	2.814E-05	0.0662	1.567E-11	0.0000	0.000E+00	0.0000	3.745E-06	0.0088	2.755E-07	0.0006	2.067E-09	0.0000	4.860E-07	0.0011
Pu-238	1.852E-09	0.0000	1.940E-11	0.0000	0.000E+00	0.0000	2.372E-07	0.0006	1.064E-08	0.0000	1.922E-10	0.0000	6.145E-07	0.0014
Pu-239	7.390E-09	0.0000	3.112E-11	0.0000	0.000E+00	0.0000	3.711E-07	0.0009	1.665E-08	0.0000	2.804E-10	0.0000	9.615E-07	0.0023
Pu-241	2.869E-08	0.0001	6.465E-13	0.0000	0.000E+00	0.0000	8.490E-09	0.0000	2.027E-10	0.0000	1.242E-11	0.0000	2.199E-08	0.0001
Se-79	1.105E-11	0.0000	3.031E-16	0.0000	0.000E+00	0.0000	5.574E-08	0.0001	3.262E-07	0.0008	4.598E-08	0.0001	1.444E-09	0.0000
Sn-126	8.569E-06	0.0202	6.288E-15	0.0000	0.000E+00	0.0000	5.644E-09	0.0000	1.203E-08	0.0000	1.963E-09	0.0000	5.844E-09	0.0000
Sr-90	2.119E-07	0.0005	7.321E-14	0.0000	0.000E+00	0.0000	1.820E-05	0.0428	8.026E-06	0.0189	2.813E-06	0.0066	1.575E-07	0.0004
Tc-99	8.152E-11	0.0000	5.804E-16	0.0000	0.000E+00	0.0000	1.151E-06	0.0027	6.286E-09	0.0000	8.724E-08	0.0002	5.962E-10	0.0000
U-233	2.551E-07	0.0006	1.653E-11	0.0000	0.000E+00	0.0000	5.201E-07	0.0012	3.726E-08	0.0001	1.068E-07	0.0003	5.518E-07	0.0013
U-234	1.140E-08	0.0000	1.559E-11	0.0000	0.000E+00	0.0000	5.055E-07	0.0012	3.642E-08	0.0001	1.053E-07	0.0002	5.242E-07	0.0012
U-235	1.993E-05	0.0469	1.414E-11	0.0000	0.000E+00	0.0000	5.240E-07	0.0012	3.980E-08	0.0001	1.076E-07	0.0003	5.393E-07	0.0013
U-238	4.098E-06	0.0096	1.325E-11	0.0000	0.000E+00	0.0000	6.378E-07	0.0015	4.596E-08	0.0001	1.330E-07	0.0003	6.617E-07	0.0016
Total	9.445E-05	0.2222	1.461E-10	0.0000	0.000E+00	0.0000	3.558E-05	0.0837	1.505E-05	0.0354	1.328E-05	0.0312	6.346E-06	0.0149

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 32
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.983E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.893E-06	0.0045
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-19	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.664E-06	0.0086
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-05	0.0758
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.981E-09	0.0000	5.599E-10	0.0000	1.007E-09	0.0000	4.547E-09	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.276E-05	0.0535
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.127E-07	0.0005
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.265E-05	0.0768
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.643E-07	0.0020
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.357E-06	0.0032
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.939E-08	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.090E-05	0.0256	1.193E-04	0.2807	2.122E-05	0.0499	1.519E-04	0.3573
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.353E-05	0.1024	4.817E-05	0.1133	8.571E-06	0.0202	1.089E-04	0.2562
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.941E-05	0.0692
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.543E-06	0.0177	5.564E-08	0.0001	9.646E-07	0.0023	9.808E-06	0.0231
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.471E-06	0.0035
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.183E-06	0.0028
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-05	0.0498
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.576E-06	0.0131
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.197E-05	0.1458	1.675E-04	0.3942	3.075E-05	0.0724	4.250E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 33
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+01 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.814E-09	1.720E-02	2.288E-04	1.197E-04	1.774E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.529E-02
Am-241	7.912E-06	2.988E+01	6.703E-01	4.514E-02	7.741E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.080E+02
C-14	1.414E-17	1.208E-14	1.146E-14	5.345E-15	9.508E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.890E-14
Co-60	1.558E-07	4.699E+01	5.521E+01	7.847E+00	1.525E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.116E+02
Cs-137	4.026E-06	6.072E+02	1.160E+03	4.469E+02	3.939E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.253E+03
H-3	1.524E-10	3.171E-09	1.149E-09	1.141E-09	1.220E-12	0.000E+00	0.000E+00	4.770E-01	9.087E-02	1.618E-01	7.296E-01
I-129	6.062E-06	4.575E+02	2.359E+02	4.993E+02	5.930E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.252E+03
Ni-63	6.457E-06	1.217E+03	3.755E+02	2.157E+03	6.317E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.812E+03
Np-237	7.933E-06	5.981E+02	4.401E+01	3.262E-01	7.761E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.201E+02
Pa-231	5.110E-09	1.926E-01	8.960E-02	1.386E-04	4.999E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.323E-01
Pb-210	3.532E-12	1.342E-04	1.036E-05	5.868E-06	3.455E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.850E-04
Pu-238	6.385E-06	2.411E+01	1.082E+00	1.821E-02	6.247E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.767E+01
Pu-239	8.085E-06	3.053E+01	1.370E+00	2.307E-02	7.910E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.110E+02
Pu-241	1.910E-06	7.210E+00	3.235E-01	5.447E-03	1.868E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.622E+01
Ra-226	1.411E-11	2.125E-03	1.341E-04	1.945E-04	1.380E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.591E-03
Se-79	5.497E-07	2.076E+02	1.215E+03	1.713E+02	5.378E+00	0.000E+00	0.000E+00	4.061E+04	4.449E+05	7.908E+04	5.661E+05
Sn-126	5.498E-07	5.194E+00	1.107E+01	1.806E+00	5.379E+00	0.000E+00	0.000E+00	4.006E+04	4.438E+04	7.893E+03	9.236E+04
Sr-90	3.918E-06	4.430E+03	1.953E+03	6.845E+02	3.833E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.107E+03
Tc-99	5.498E-07	1.038E+04	5.672E+01	7.872E+02	5.379E+00	0.000E+00	0.000E+00	6.807E+04	5.026E+02	8.709E+03	8.851E+04
Th-229	2.286E-08	8.639E-02	3.897E-03	3.303E-04	2.236E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.142E-01
Th-230	2.182E-09	8.246E-03	3.719E-04	3.152E-05	2.134E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.999E-02
U-233	8.053E-06	7.594E+01	5.472E+00	1.583E+01	7.879E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.760E+02
U-234	8.054E-06	7.595E+01	5.472E+00	1.583E+01	7.879E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.760E+02
U-235	8.053E-06	7.594E+01	5.472E+00	1.583E+01	7.879E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.760E+02
U-238	8.053E-06	7.594E+01	5.472E+00	1.583E+01	7.879E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.760E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 34
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.287E-08	0.0002	9.607E-14	0.0000	2.789E-09	0.0000	2.714E-11	0.0000	1.939E-11	0.0000	2.883E-09	0.0000
Am-241	9.581E-07	0.0039	1.983E-11	0.0000	2.661E-07	0.0011	5.971E-09	0.0000	4.021E-10	0.0000	6.895E-07	0.0028
C-14	0.000E+00	0.0000	1.651E-29	0.0000	1.653E-26	0.0000	1.568E-26	0.0000	7.311E-27	0.0000	1.241E-29	0.0000
Co-60	9.408E-07	0.0038	1.195E-16	0.0000	7.955E-09	0.0000	9.345E-09	0.0000	1.328E-09	0.0000	2.581E-10	0.0000
Cs-137	2.249E-05	0.0920	1.556E-14	0.0000	7.834E-07	0.0032	1.497E-06	0.0061	5.767E-07	0.0024	5.083E-08	0.0002
H-3	0.000E+00	0.0000	1.216E-22	0.0000	4.282E-22	0.0000	1.552E-22	0.0000	1.541E-22	0.0000	1.648E-25	0.0000
I-129	1.272E-07	0.0005	4.930E-14	0.0000	7.488E-06	0.0306	3.862E-06	0.0158	8.173E-06	0.0334	9.707E-07	0.0040
Ni-63	0.000E+00	0.0000	2.024E-15	0.0000	6.287E-08	0.0003	1.940E-08	0.0001	1.114E-07	0.0005	3.263E-09	0.0000
Np-237	2.794E-05	0.1142	1.555E-11	0.0000	3.718E-06	0.0152	2.735E-07	0.0011	2.027E-09	0.0000	4.824E-07	0.0020
Pa-231	6.894E-09	0.0000	5.851E-14	0.0000	6.541E-09	0.0000	3.048E-09	0.0000	4.693E-12	0.0000	1.698E-09	0.0000
Pb-210	6.522E-13	0.0000	7.308E-17	0.0000	3.097E-10	0.0000	2.355E-11	0.0000	1.343E-11	0.0000	8.004E-11	0.0000
Pu-238	1.707E-09	0.0000	1.789E-11	0.0000	2.187E-07	0.0009	9.813E-09	0.0000	1.652E-10	0.0000	5.666E-07	0.0023
Pu-239	7.382E-09	0.0000	3.109E-11	0.0000	3.708E-07	0.0015	1.664E-08	0.0001	2.801E-10	0.0000	9.607E-07	0.0039
Pu-241	3.341E-11	0.0000	3.314E-14	0.0000	3.295E-10	0.0000	1.478E-11	0.0000	2.489E-13	0.0000	8.537E-10	0.0000
Ra-226	2.737E-09	0.0000	1.420E-16	0.0000	3.895E-10	0.0000	2.471E-11	0.0000	3.576E-11	0.0000	2.529E-11	0.0000
Se-79	4.436E-12	0.0000	1.217E-16	0.0000	2.239E-08	0.0001	1.310E-07	0.0005	1.847E-08	0.0001	5.799E-10	0.0000
Sn-126	3.442E-06	0.0141	2.526E-15	0.0000	2.267E-09	0.0000	4.832E-09	0.0000	7.882E-10	0.0000	2.347E-09	0.0000
Sr-90	1.656E-07	0.0007	5.721E-14	0.0000	1.423E-05	0.0582	6.273E-06	0.0256	2.198E-06	0.0090	1.231E-07	0.0005
Tc-99	3.275E-11	0.0000	2.331E-16	0.0000	4.622E-07	0.0019	2.525E-09	0.0000	3.504E-08	0.0001	2.395E-10	0.0000
Th-229	2.594E-07	0.0011	7.914E-13	0.0000	9.317E-09	0.0000	4.191E-10	0.0000	3.539E-11	0.0000	2.413E-08	0.0001
Th-230	1.771E-11	0.0000	1.120E-14	0.0000	1.481E-10	0.0000	6.660E-12	0.0000	5.624E-13	0.0000	3.835E-10	0.0000
U-233	3.598E-08	0.0001	1.583E-11	0.0000	5.112E-07	0.0021	3.684E-08	0.0002	1.066E-07	0.0004	5.304E-07	0.0022
U-234	9.350E-09	0.0000	1.556E-11	0.0000	5.039E-07	0.0021	3.631E-08	0.0001	1.051E-07	0.0004	5.228E-07	0.0021
U-235	1.985E-05	0.0811	1.399E-11	0.0000	5.151E-07	0.0021	3.712E-08	0.0002	1.074E-07	0.0004	5.344E-07	0.0022
U-238	4.089E-06	0.0167	1.322E-11	0.0000	6.363E-07	0.0026	4.585E-08	0.0002	1.327E-07	0.0005	6.602E-07	0.0027
Total	8.037E-05	0.3285	1.441E-10	0.0000	2.982E-05	0.1219	1.226E-05	0.0501	1.157E-05	0.0473	6.128E-06	0.0251

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 35
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.859E-08	0.0002
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.920E-06	0.0078
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.955E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.597E-07	0.0039
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-05	0.1038
H-3	0.000E+00	0.0000	0.000E+00	0.0000	6.494E-14	0.0000	1.237E-14	0.0000	2.202E-14	0.0000	9.934E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-05	0.0843
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.969E-07	0.0008
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E-05	0.1325
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.819E-08	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.274E-10	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.970E-07	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-06	0.0055
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.232E-09	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.212E-09	0.0000
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	4.373E-06	0.0179	4.791E-05	0.1958	8.516E-06	0.0348	6.097E-05	0.2492
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-05	0.0714	1.934E-05	0.0791	3.440E-06	0.0141	4.370E-05	0.1786
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.299E-05	0.0940
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-06	0.0124	2.234E-08	0.0001	3.872E-07	0.0016	3.936E-06	0.0161
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-07	0.0012
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.565E-10	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.221E-06	0.0050
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.177E-06	0.0048
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.105E-05	0.0860
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.564E-06	0.0227
Total	0.000E+00	0.0000	0.000E+00	0.0000	2.486E-05	0.1016	6.727E-05	0.2750	1.234E-05	0.0505	2.446E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+01 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 36
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	9.291E-07	0.0038	1.922E-11	0.0000	0.000E+00	0.0000	2.580E-07	0.0011	5.792E-09	0.0000	3.897E-10	0.0000	6.682E-07	0.0027
C-14	0.000E+00	0.0000	1.651E-29	0.0000	0.000E+00	0.0000	1.653E-26	0.0000	1.568E-26	0.0000	7.311E-27	0.0000	1.241E-29	0.0000
Co-60	9.408E-07	0.0038	1.195E-16	0.0000	0.000E+00	0.0000	7.955E-09	0.0000	9.345E-09	0.0000	1.328E-09	0.0000	2.581E-10	0.0000
Cs-137	2.249E-05	0.0920	1.556E-14	0.0000	0.000E+00	0.0000	7.834E-07	0.0032	1.497E-06	0.0061	5.767E-07	0.0024	5.083E-08	0.0002
H-3	0.000E+00	0.0000	1.216E-22	0.0000	0.000E+00	0.0000	4.282E-22	0.0000	1.552E-22	0.0000	1.541E-22	0.0000	1.648E-25	0.0000
I-129	1.272E-07	0.0005	4.930E-14	0.0000	0.000E+00	0.0000	7.488E-06	0.0306	3.862E-06	0.0158	8.173E-06	0.0334	9.707E-07	0.0040
Ni-63	0.000E+00	0.0000	2.024E-15	0.0000	0.000E+00	0.0000	6.287E-08	0.0003	1.940E-08	0.0001	1.114E-07	0.0005	3.263E-09	0.0000
Np-237	2.794E-05	0.1142	1.555E-11	0.0000	0.000E+00	0.0000	3.718E-06	0.0152	2.735E-07	0.0011	2.057E-09	0.0000	4.825E-07	0.0020
Pu-238	1.709E-09	0.0000	1.789E-11	0.0000	0.000E+00	0.0000	2.188E-07	0.0009	9.819E-09	0.0000	1.801E-10	0.0000	5.667E-07	0.0023
Pu-239	7.384E-09	0.0000	3.109E-11	0.0000	0.000E+00	0.0000	3.708E-07	0.0015	1.664E-08	0.0001	2.801E-10	0.0000	9.607E-07	0.0039
Pu-241	2.965E-08	0.0001	6.457E-13	0.0000	0.000E+00	0.0000	8.552E-09	0.0000	1.994E-10	0.0000	1.267E-11	0.0000	2.216E-08	0.0001
Se-79	4.436E-12	0.0000	1.217E-16	0.0000	0.000E+00	0.0000	2.239E-08	0.0001	1.310E-07	0.0005	1.847E-08	0.0001	5.799E-10	0.0000
Sn-126	3.442E-06	0.0141	2.526E-15	0.0000	0.000E+00	0.0000	2.267E-09	0.0000	4.832E-09	0.0000	7.882E-10	0.0000	2.347E-09	0.0000
Sr-90	1.656E-07	0.0007	5.721E-14	0.0000	0.000E+00	0.0000	1.423E-05	0.0582	6.273E-06	0.0256	2.198E-06	0.0090	1.231E-07	0.0005
Tc-99	3.275E-11	0.0000	2.331E-16	0.0000	0.000E+00	0.0000	4.622E-07	0.0019	2.525E-09	0.0000	3.504E-08	0.0001	2.395E-10	0.0000
U-233	2.953E-07	0.0012	1.662E-11	0.0000	0.000E+00	0.0000	5.204E-07	0.0021	3.725E-08	0.0002	1.066E-07	0.0004	5.544E-07	0.0023
U-234	1.210E-08	0.0000	1.556E-11	0.0000	0.000E+00	0.0000	5.046E-07	0.0021	3.635E-08	0.0001	1.051E-07	0.0004	5.231E-07	0.0021
U-235	1.990E-05	0.0814	1.414E-11	0.0000	0.000E+00	0.0000	5.245E-07	0.0021	4.019E-08	0.0002	1.074E-07	0.0004	5.390E-07	0.0022
U-238	4.089E-06	0.0167	1.322E-11	0.0000	0.000E+00	0.0000	6.364E-07	0.0026	4.586E-08	0.0002	1.327E-07	0.0005	6.602E-07	0.0027
Total	8.037E-05	0.3285	1.441E-10	0.0000	0.000E+00	0.0000	2.982E-05	0.1219	1.226E-05	0.0501	1.157E-05	0.0473	6.128E-06	0.0251

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 37
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.861E-06	0.0076
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.955E-26	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.597E-07	0.0039
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.540E-05	0.1038
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.494E-14	0.0000	1.237E-14	0.0000	2.202E-14	0.0000	9.934E-14	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.062E-05	0.0843
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.969E-07	0.0008
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E-05	0.1325
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.972E-07	0.0033
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.356E-06	0.0055
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.057E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.373E-06	0.0179	4.791E-05	0.1958	8.516E-06	0.0348	6.097E-05	0.2492
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-05	0.0714	1.934E-05	0.0791	3.440E-06	0.0141	4.370E-05	0.1786
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.299E-05	0.0940
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-06	0.0124	2.234E-08	0.0001	3.872E-07	0.0016	3.936E-06	0.0161
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.514E-06	0.0062
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.181E-06	0.0048
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.111E-05	0.0863
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.564E-06	0.0227
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.486E-05	0.1016	6.727E-05	0.2750	1.234E-05	0.0505	2.446E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 38
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.164E-08	1.101E-01	9.795E-04	7.659E-04	1.139E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.258E-01
Am-241	7.101E-06	2.681E+01	6.016E-01	4.052E-02	6.948E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.693E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	1.543E-11	4.653E-03	5.466E-03	7.770E-04	1.509E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.105E-02
Cs-137	7.869E-07	1.187E+02	2.267E+02	8.735E+01	7.699E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.404E+02
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	3.077E-06	2.322E+02	1.198E+02	2.535E+02	3.010E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.355E+02
Ni-63	3.798E-06	7.159E+02	2.209E+02	1.269E+03	3.716E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.243E+03
Np-237	7.544E-06	5.688E+02	4.185E+01	3.102E-01	7.380E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.848E+02
Pa-231	1.676E-08	6.320E-01	2.947E-01	4.530E-04	1.640E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.091E+00
Pb-210	8.550E-11	3.235E-03	2.453E-04	1.401E-04	8.365E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.457E-03
Pu-238	3.659E-06	1.382E+01	6.199E-01	1.044E-02	3.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.024E+01
Pu-239	8.038E-06	3.035E+01	1.362E+00	2.293E-02	7.864E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.104E+02
Pu-241	6.545E-08	2.471E-01	1.109E-02	1.867E-04	6.404E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.988E-01
Ra-226	1.538E-10	2.319E-02	1.473E-03	2.130E-03	1.505E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.830E-02
Se-79	1.031E-09	3.894E-01	2.279E+00	3.212E-01	1.009E-02	0.000E+00	0.000E+00	7.555E+01	8.277E+02	1.471E+02	1.053E+03
Sn-126	1.031E-09	9.745E-03	2.077E-02	3.389E-03	1.009E-02	0.000E+00	0.000E+00	7.457E+01	8.259E+01	1.469E+01	1.719E+02
Sr-90	7.182E-07	8.122E+02	3.581E+02	1.255E+02	7.027E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.303E+03
Tc-99	1.032E-09	1.948E+01	1.064E-01	1.477E+00	1.009E-02	0.000E+00	0.000E+00	1.267E+02	9.356E-01	1.621E+01	1.650E+02
Th-229	7.536E-08	2.846E-01	1.279E-02	1.079E-03	7.373E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.036E+00
Th-230	7.215E-09	2.725E-02	1.225E-03	1.033E-04	7.059E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.917E-02
U-233	7.932E-06	7.480E+01	5.390E+00	1.559E+01	7.760E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.734E+02
U-234	7.933E-06	7.482E+01	5.391E+00	1.560E+01	7.762E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.734E+02
U-235	7.932E-06	7.480E+01	5.390E+00	1.559E+01	7.760E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.734E+02
U-238	7.932E-06	7.480E+01	5.390E+00	1.559E+01	7.760E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.734E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 39
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
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Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.142E-07	0.0014	2.560E-13	0.0000	7.424E-09	0.0001	6.284E-11	0.0000	5.162E-11	0.0000	7.682E-09	0.0001
Am-241	8.552E-07	0.0102	1.770E-11	0.0000	2.375E-07	0.0028	5.329E-09	0.0001	3.589E-10	0.0000	6.154E-07	0.0074
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	9.320E-11	0.0000	1.184E-20	0.0000	7.881E-13	0.0000	9.258E-13	0.0000	1.316E-13	0.0000	2.557E-14	0.0000
Cs-137	4.396E-06	0.0525	3.041E-15	0.0000	1.531E-07	0.0018	2.925E-07	0.0035	1.127E-07	0.0013	9.934E-09	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.457E-08	0.0008	2.503E-14	0.0000	3.801E-06	0.0454	1.960E-06	0.0234	4.149E-06	0.0496	4.927E-07	0.0059
Ni-63	0.000E+00	0.0000	1.190E-15	0.0000	3.698E-08	0.0004	1.141E-08	0.0001	6.553E-08	0.0008	1.919E-09	0.0000
Np-237	2.657E-05	0.3175	1.479E-11	0.0000	3.535E-06	0.0423	2.601E-07	0.0031	1.928E-09	0.0000	4.587E-07	0.0055
Pa-231	1.410E-08	0.0002	1.197E-13	0.0000	1.338E-08	0.0002	6.241E-09	0.0001	9.588E-12	0.0000	3.473E-09	0.0000
Pb-210	3.512E-12	0.0000	3.935E-16	0.0000	1.666E-09	0.0000	1.261E-10	0.0000	7.205E-11	0.0000	4.310E-10	0.0000
Pu-238	9.782E-10	0.0000	1.025E-11	0.0000	1.253E-07	0.0015	5.624E-09	0.0001	9.468E-11	0.0000	3.247E-07	0.0039
Pu-239	7.340E-09	0.0001	3.091E-11	0.0000	3.686E-07	0.0044	1.654E-08	0.0002	2.785E-10	0.0000	9.551E-07	0.0114
Pu-241	1.145E-12	0.0000	1.136E-15	0.0000	1.129E-11	0.0000	5.068E-13	0.0000	8.532E-15	0.0000	2.926E-11	0.0000
Ra-226	1.082E-08	0.0001	5.611E-16	0.0000	1.540E-09	0.0000	9.788E-11	0.0000	1.415E-10	0.0000	9.995E-11	0.0000
Se-79	8.322E-15	0.0000	2.283E-19	0.0000	4.199E-11	0.0000	2.458E-10	0.0000	3.464E-11	0.0000	1.088E-12	0.0000
Sn-126	6.458E-09	0.0001	4.739E-18	0.0000	4.253E-12	0.0000	9.067E-12	0.0000	1.479E-12	0.0000	4.404E-12	0.0000
Sr-90	3.036E-08	0.0004	1.049E-14	0.0000	2.608E-06	0.0312	1.150E-06	0.0137	4.030E-07	0.0048	2.256E-08	0.0003
Tc-99	6.146E-14	0.0000	4.375E-19	0.0000	8.674E-10	0.0000	4.739E-12	0.0000	6.577E-11	0.0000	4.494E-13	0.0000
Th-229	5.332E-07	0.0064	1.627E-12	0.0000	1.915E-08	0.0002	8.601E-10	0.0000	7.252E-11	0.0000	4.960E-08	0.0006
Th-230	3.651E-11	0.0000	2.309E-14	0.0000	3.052E-10	0.0000	1.371E-11	0.0000	1.156E-12	0.0000	7.905E-10	0.0000
U-233	3.544E-08	0.0004	1.559E-11	0.0000	5.035E-07	0.0060	3.628E-08	0.0004	1.050E-07	0.0013	5.224E-07	0.0062
U-234	9.210E-09	0.0001	1.532E-11	0.0000	4.964E-07	0.0059	3.577E-08	0.0004	1.035E-07	0.0012	5.150E-07	0.0062
U-235	1.955E-05	0.2337	1.378E-11	0.0000	5.074E-07	0.0061	3.656E-08	0.0004	1.058E-07	0.0013	5.264E-07	0.0063
U-238	4.027E-06	0.0481	1.302E-11	0.0000	6.268E-07	0.0075	4.516E-08	0.0005	1.307E-07	0.0016	6.502E-07	0.0078
Total	5.623E-05	0.6720	1.334E-10	0.0000	1.304E-05	0.1559	3.863E-06	0.0462	5.178E-06	0.0619	5.157E-06	0.0616

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 40
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.294E-07	0.0015
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.714E-06	0.0205
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.507E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-06	0.0593
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-05	0.1251
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.158E-07	0.0014
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.082E-05	0.3684
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.721E-08	0.0004
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.299E-09	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.567E-07	0.0055
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.348E-06	0.0161
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.222E-11	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.270E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	8.137E-09	0.0001	8.915E-08	0.0011	1.585E-08	0.0002	1.135E-07	0.0014
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	3.251E-08	0.0004	3.600E-08	0.0004	6.404E-09	0.0001	8.139E-08	0.0010
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.214E-06	0.0504
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	5.635E-09	0.0001	4.160E-11	0.0000	7.209E-10	0.0000	7.336E-09	0.0001
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.029E-07	0.0072
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-09	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.203E-06	0.0144
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.160E-06	0.0139
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.073E-05	0.2478
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.480E-06	0.0655
Total	0.000E+00	0.0000	0.000E+00	0.0000	4.628E-08	0.0006	1.252E-07	0.0015	2.297E-08	0.0003	8.366E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 41
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	8.279E-07	0.0099	1.711E-11	0.0000	0.000E+00	0.0000	2.298E-07	0.0027	5.163E-09	0.0001	3.471E-10	0.0000	5.950E-07	0.0071
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	9.320E-11	0.0000	1.184E-20	0.0000	0.000E+00	0.0000	7.881E-13	0.0000	9.258E-13	0.0000	1.316E-13	0.0000	2.557E-14	0.0000
Cs-137	4.396E-06	0.0525	3.041E-15	0.0000	0.000E+00	0.0000	1.531E-07	0.0018	2.925E-07	0.0035	1.127E-07	0.0013	9.934E-09	0.0001
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	6.457E-08	0.0008	2.503E-14	0.0000	0.000E+00	0.0000	3.801E-06	0.0454	1.960E-06	0.0234	4.149E-06	0.0496	4.927E-07	0.0059
Ni-63	0.000E+00	0.0000	1.190E-15	0.0000	0.000E+00	0.0000	3.698E-08	0.0004	1.141E-08	0.0001	6.553E-08	0.0008	1.919E-09	0.0000
Np-237	2.657E-05	0.3175	1.480E-11	0.0000	0.000E+00	0.0000	3.535E-06	0.0423	2.601E-07	0.0031	1.988E-09	0.0000	4.590E-07	0.0055
Pu-238	9.815E-10	0.0000	1.026E-11	0.0000	0.000E+00	0.0000	1.254E-07	0.0015	5.632E-09	0.0001	1.191E-10	0.0000	3.248E-07	0.0039
Pu-239	7.342E-09	0.0001	3.091E-11	0.0000	0.000E+00	0.0000	3.686E-07	0.0044	1.654E-08	0.0002	2.785E-10	0.0000	9.551E-07	0.0114
Pu-241	2.844E-08	0.0003	5.892E-13	0.0000	0.000E+00	0.0000	7.907E-09	0.0001	1.779E-10	0.0000	1.194E-11	0.0000	2.048E-08	0.0002
Se-79	8.322E-15	0.0000	2.283E-19	0.0000	0.000E+00	0.0000	4.199E-11	0.0000	2.458E-10	0.0000	3.464E-11	0.0000	1.088E-12	0.0000
Sn-126	6.458E-09	0.0001	4.739E-18	0.0000	0.000E+00	0.0000	4.253E-12	0.0000	9.067E-12	0.0000	1.479E-12	0.0000	4.404E-12	0.0000
Sr-90	3.036E-08	0.0004	1.049E-14	0.0000	0.000E+00	0.0000	2.608E-06	0.0312	1.150E-06	0.0137	4.030E-07	0.0048	2.256E-08	0.0003
Tc-99	6.146E-14	0.0000	4.375E-19	0.0000	0.000E+00	0.0000	8.674E-10	0.0000	4.739E-12	0.0000	6.577E-11	0.0000	4.494E-13	0.0000
U-233	5.685E-07	0.0068	1.721E-11	0.0000	0.000E+00	0.0000	5.224E-07	0.0062	3.712E-08	0.0004	1.050E-07	0.0013	5.717E-07	0.0068
U-234	2.006E-08	0.0002	1.534E-11	0.0000	0.000E+00	0.0000	4.996E-07	0.0060	3.598E-08	0.0004	1.036E-07	0.0012	5.160E-07	0.0062
U-235	1.968E-05	0.2352	1.415E-11	0.0000	0.000E+00	0.0000	5.282E-07	0.0063	4.286E-08	0.0005	1.058E-07	0.0013	5.375E-07	0.0064
U-238	4.027E-06	0.0481	1.303E-11	0.0000	0.000E+00	0.0000	6.269E-07	0.0075	4.517E-08	0.0005	1.307E-07	0.0016	6.504E-07	0.0078
Total	5.623E-05	0.6720	1.334E-10	0.0000	0.000E+00	0.0000	1.304E-05	0.1559	3.863E-06	0.0462	5.178E-06	0.0619	5.157E-06	0.0616

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 42
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.658E-06	0.0198
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.507E-11	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.964E-06	0.0593
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.047E-05	0.1251
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.158E-07	0.0014
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.082E-05	0.3684
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.570E-07	0.0055
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.348E-06	0.0161
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.702E-08	0.0007
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.137E-09	0.0001	8.915E-08	0.0011	1.585E-08	0.0002	1.135E-07	0.0014
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.251E-08	0.0004	3.600E-08	0.0004	6.404E-09	0.0001	8.139E-08	0.0010
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.214E-06	0.0504
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.635E-09	0.0001	4.160E-11	0.0000	7.209E-10	0.0000	7.336E-09	0.0001
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.805E-06	0.0216
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.175E-06	0.0140
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.090E-05	0.2498
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.480E-06	0.0655
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.628E-08	0.0006	1.252E-07	0.0015	2.297E-08	0.0003	8.366E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 43
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 3.000E+02 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	4.266E-08	4.032E-01	3.180E-03	2.803E-03	4.173E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.265E-01
Am-241	5.099E-06	1.925E+01	4.320E-01	2.909E-02	4.988E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.960E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	5.589E-23	1.686E-14	1.980E-14	2.815E-15	5.468E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.002E-14
Cs-137	7.417E-09	1.118E+00	2.137E+00	8.233E-01	7.257E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.151E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	4.434E-07	3.346E+01	1.726E+01	3.652E+01	4.338E+00	0.000E+00	0.000E+00	3.418E+03	2.612E+03	6.676E+03	1.280E+04
Ni-63	8.339E-07	1.572E+02	4.849E+01	2.785E+02	8.158E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.924E+02
Np-237	6.534E-06	4.927E+02	3.625E+01	2.687E-01	6.393E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.932E+02
Pa-231	4.806E-08	1.812E+00	8.454E-01	1.297E-03	4.702E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.129E+00
Pb-210	1.065E-09	4.026E-02	3.039E-03	1.739E-03	1.042E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.546E-02
Pu-238	7.455E-07	2.815E+00	1.263E-01	2.127E-03	7.293E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.024E+01
Pu-239	7.906E-06	2.985E+01	1.340E+00	2.255E-02	7.735E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.086E+02
Pu-241	4.268E-12	1.612E-05	7.232E-07	1.218E-08	4.176E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.861E-05
Ra-226	1.312E-09	1.979E-01	1.259E-02	1.820E-02	1.284E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.415E-01
Se-79	1.668E-17	6.301E-09	3.687E-08	5.197E-09	1.632E-10	0.000E+00	0.000E+00	1.193E-06	1.307E-05	2.324E-06	1.664E-05
Sn-126	1.670E-17	1.578E-10	3.364E-10	5.487E-11	1.634E-10	0.000E+00	0.000E+00	1.179E-06	1.305E-06	2.322E-07	2.717E-06
Sr-90	5.639E-09	6.377E+00	2.812E+00	9.852E-01	5.517E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.023E+01
Tc-99	1.672E-17	3.157E-07	1.725E-09	2.394E-08	1.636E-10	0.000E+00	0.000E+00	2.004E-06	1.480E-08	2.565E-07	2.617E-06
Th-229	2.192E-07	8.276E-01	3.716E-02	3.130E-03	2.144E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.012E+00
Th-230	2.117E-08	7.994E-02	3.589E-03	3.023E-04	2.071E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.909E-01
U-233	7.595E-06	7.162E+01	5.161E+00	1.493E+01	7.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.660E+02
U-234	7.598E-06	7.165E+01	5.163E+00	1.494E+01	7.433E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.661E+02
U-235	7.595E-06	7.163E+01	5.161E+00	1.493E+01	7.431E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.660E+02
U-238	7.595E-06	7.163E+01	5.161E+00	1.493E+01	7.431E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.660E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 3.000E+02 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 44
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.179E-07	0.0012	7.124E-13	0.0000	2.066E-08	0.0001	1.620E-10	0.0000	1.436E-10	0.0000	2.138E-08	0.0001
Am-241	6.139E-07	0.0023	1.270E-11	0.0000	1.705E-07	0.0006	3.826E-09	0.0000	2.576E-10	0.0000	4.418E-07	0.0017
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	3.377E-22	0.0000	0.000E+00	0.0000	2.855E-24	0.0000	3.354E-24	0.0000	4.768E-25	0.0000	9.263E-26	0.0000
Cs-137	4.144E-08	0.0002	2.866E-17	0.0000	1.443E-09	0.0000	2.757E-09	0.0000	1.062E-09	0.0000	9.363E-11	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.305E-09	0.0000	3.606E-15	0.0000	5.478E-07	0.0020	2.825E-07	0.0011	5.979E-07	0.0022	7.101E-08	0.0003
Ni-63	0.000E+00	0.0000	2.613E-16	0.0000	8.119E-09	0.0000	2.505E-09	0.0000	1.439E-08	0.0001	4.214E-10	0.0000
Np-237	2.301E-05	0.0860	1.281E-11	0.0000	3.062E-06	0.0114	2.253E-07	0.0008	1.670E-09	0.0000	3.973E-07	0.0015
Pa-231	3.345E-08	0.0001	2.839E-13	0.0000	3.175E-08	0.0001	1.481E-08	0.0001	2.273E-11	0.0000	8.238E-09	0.0000
Pb-210	2.595E-11	0.0000	2.907E-15	0.0000	1.230E-08	0.0000	9.280E-10	0.0000	5.310E-10	0.0000	3.184E-09	0.0000
Pu-238	1.993E-10	0.0000	2.089E-12	0.0000	2.553E-08	0.0001	1.146E-09	0.0000	1.929E-11	0.0000	6.616E-08	0.0002
Pu-239	7.219E-09	0.0000	3.040E-11	0.0000	3.625E-07	0.0014	1.627E-08	0.0001	2.739E-10	0.0000	9.394E-07	0.0035
Pu-241	7.467E-17	0.0000	7.408E-20	0.0000	7.365E-16	0.0000	3.305E-17	0.0000	5.564E-19	0.0000	1.908E-15	0.0000
Ra-226	6.204E-08	0.0002	3.218E-15	0.0000	8.834E-09	0.0000	5.621E-10	0.0000	8.124E-10	0.0000	5.732E-10	0.0000
Se-79	1.347E-22	0.0000	3.688E-27	0.0000	6.795E-19	0.0000	3.976E-18	0.0000	5.605E-19	0.0000	1.760E-20	0.0000
Sn-126	1.046E-16	0.0000	7.674E-26	0.0000	6.887E-20	0.0000	1.468E-19	0.0000	2.395E-20	0.0000	7.132E-20	0.0000
Sr-90	2.383E-10	0.0000	8.235E-17	0.0000	2.048E-08	0.0001	9.029E-09	0.0000	3.164E-09	0.0000	1.772E-10	0.0000
Tc-99	9.959E-22	0.0000	7.090E-27	0.0000	1.406E-17	0.0000	7.679E-20	0.0000	1.066E-18	0.0000	7.282E-21	0.0000
Th-229	1.283E-06	0.0048	3.914E-12	0.0000	4.606E-08	0.0002	2.068E-09	0.0000	1.742E-10	0.0000	1.193E-07	0.0004
Th-230	8.863E-11	0.0000	5.603E-14	0.0000	7.406E-10	0.0000	3.325E-11	0.0000	2.800E-12	0.0000	1.919E-09	0.0000
U-233	3.393E-08	0.0001	1.493E-11	0.0000	4.821E-07	0.0018	3.474E-08	0.0001	1.005E-07	0.0004	5.002E-07	0.0019
U-234	8.820E-09	0.0000	1.467E-11	0.0000	4.754E-07	0.0018	3.425E-08	0.0001	9.911E-08	0.0004	4.932E-07	0.0018
U-235	1.872E-05	0.0699	1.319E-11	0.0000	4.859E-07	0.0018	3.501E-08	0.0001	1.013E-07	0.0004	5.041E-07	0.0019
U-238	3.856E-06	0.0144	1.247E-11	0.0000	6.002E-07	0.0022	4.325E-08	0.0002	1.251E-07	0.0005	6.226E-07	0.0023
Total	4.800E-05	0.1793	1.183E-10	0.0000	6.363E-06	0.0238	7.092E-07	0.0026	1.046E-06	0.0039	4.191E-06	0.0157

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 45
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.603E-07	0.0013
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.230E-06	0.0046
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.444E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.679E-08	0.0002
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	5.579E-05	0.2084	4.263E-05	0.1592	1.090E-04	0.4071	2.089E-04	0.7803
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.543E-08	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.670E-05	0.0997
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.827E-08	0.0003
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.697E-08	0.0001
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.306E-08	0.0003
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-06	0.0050
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.753E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.282E-08	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	1.285E-16	0.0000	1.408E-15	0.0000	2.503E-16	0.0000	1.792E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	5.137E-16	0.0000	5.690E-16	0.0000	1.012E-16	0.0000	1.289E-15	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.309E-08	0.0001
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	8.911E-17	0.0000	6.579E-19	0.0000	1.140E-17	0.0000	1.164E-16	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.451E-06	0.0054
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.784E-09	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.152E-06	0.0043
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.111E-06	0.0041
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.985E-05	0.0741
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.248E-06	0.0196
Total	0.000E+00	0.0000	0.000E+00	0.0000	5.579E-05	0.2084	4.263E-05	0.1592	1.090E-04	0.4071	2.677E-04	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 3.000E+02 years
0 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 46
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	5.956E-07	0.0022	1.228E-11	0.0000	0.000E+00	0.0000	1.651E-07	0.0006	3.719E-09	0.0000	2.492E-10	0.0000	4.271E-07	0.0016
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	3.377E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.855E-24	0.0000	3.354E-24	0.0000	4.768E-25	0.0000	9.263E-26	0.0000
Cs-137	4.144E-08	0.0002	2.866E-17	0.0000	0.000E+00	0.0000	1.443E-09	0.0000	2.757E-09	0.0000	1.062E-09	0.0000	9.363E-11	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	9.305E-09	0.0000	3.606E-15	0.0000	0.000E+00	0.0000	5.478E-07	0.0020	2.825E-07	0.0011	5.979E-07	0.0022	7.101E-08	0.0003
Ni-63	0.000E+00	0.0000	2.613E-16	0.0000	0.000E+00	0.0000	8.119E-09	0.0000	2.505E-09	0.0000	1.439E-08	0.0001	4.214E-10	0.0000
Np-237	2.301E-05	0.0860	1.283E-11	0.0000	0.000E+00	0.0000	3.063E-06	0.0114	2.253E-07	0.0008	1.805E-09	0.0000	3.981E-07	0.0015
Pu-238	2.138E-10	0.0000	2.094E-12	0.0000	0.000E+00	0.0000	2.570E-08	0.0001	1.158E-09	0.0000	5.306E-11	0.0000	6.633E-08	0.0002
Pu-239	7.225E-09	0.0000	3.040E-11	0.0000	0.000E+00	0.0000	3.625E-07	0.0014	1.627E-08	0.0001	2.739E-10	0.0000	9.394E-07	0.0035
Pu-241	2.052E-08	0.0001	4.233E-13	0.0000	0.000E+00	0.0000	5.690E-09	0.0000	1.281E-10	0.0000	8.589E-12	0.0000	1.472E-08	0.0001
Se-79	1.347E-22	0.0000	3.688E-27	0.0000	0.000E+00	0.0000	6.795E-19	0.0000	3.976E-18	0.0000	5.605E-19	0.0000	1.760E-20	0.0000
Sn-126	1.046E-16	0.0000	7.674E-26	0.0000	0.000E+00	0.0000	6.887E-20	0.0000	1.468E-19	0.0000	2.395E-20	0.0000	7.132E-20	0.0000
Sr-90	2.383E-10	0.0000	8.235E-17	0.0000	0.000E+00	0.0000	2.048E-08	0.0001	9.029E-09	0.0000	3.164E-09	0.0000	1.772E-10	0.0000
Tc-99	9.959E-22	0.0000	7.090E-27	0.0000	0.000E+00	0.0000	1.406E-17	0.0000	7.679E-20	0.0000	1.066E-18	0.0000	7.282E-21	0.0000
U-233	1.316E-06	0.0049	1.882E-11	0.0000	0.000E+00	0.0000	5.275E-07	0.0020	3.676E-08	0.0001	1.006E-07	0.0004	6.188E-07	0.0023
U-234	7.093E-08	0.0003	1.472E-11	0.0000	0.000E+00	0.0000	4.966E-07	0.0019	3.573E-08	0.0001	1.003E-07	0.0004	4.982E-07	0.0019
U-235	1.907E-05	0.0713	1.419E-11	0.0000	0.000E+00	0.0000	5.383E-07	0.0020	4.998E-08	0.0002	1.015E-07	0.0004	5.337E-07	0.0020
U-238	3.856E-06	0.0144	1.248E-11	0.0000	0.000E+00	0.0000	6.006E-07	0.0022	4.328E-08	0.0002	1.252E-07	0.0005	6.231E-07	0.0023
Total	4.800E-05	0.1793	1.183E-10	0.0000	0.000E+00	0.0000	6.363E-06	0.0238	7.092E-07	0.0026	1.046E-06	0.0039	4.191E-06	0.0157

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 47
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.192E-06	0.0045
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.444E-22	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.679E-08	0.0002
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.579E-05	0.2084	4.263E-05	0.1592	1.090E-04	0.4071	2.089E-04	0.7803
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.543E-08	0.0001
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.670E-05	0.0997
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.345E-08	0.0003
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.326E-06	0.0050
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.107E-08	0.0002
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.285E-16	0.0000	1.408E-15	0.0000	2.503E-16	0.0000	1.792E-15	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.137E-16	0.0000	5.690E-16	0.0000	1.012E-16	0.0000	1.289E-15	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.309E-08	0.0001
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.911E-17	0.0000	6.579E-19	0.0000	1.140E-17	0.0000	1.164E-16	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.600E-06	0.0097
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.202E-06	0.0045
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.030E-05	0.0758
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.249E-06	0.0196
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.579E-05	0.2084	4.263E-05	0.1592	1.090E-04	0.4071	2.677E-04	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 48
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As pCi/yr at t= 1.000E+03 years

Radio-	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total
Nuclide	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	Ingestion*
Ac-227	1.311E-07	1.239E+00	9.435E-03	8.614E-03	1.283E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.540E+00
Am-241	1.597E-06	6.032E+00	1.353E-01	9.114E-03	1.563E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.180E+01
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	6.031E-16	9.094E-08	1.737E-07	6.694E-08	5.900E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.375E-07
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-129	5.037E-10	3.802E-02	1.961E-02	4.149E-02	4.928E-03	0.000E+00	0.000E+00	3.603E+00	2.753E+00	7.038E+00	1.350E+01
Ni-63	4.135E-09	7.794E-01	2.405E-01	1.381E+00	4.046E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.442E+00
Np-237	3.952E-06	2.980E+02	2.193E+01	1.625E-01	3.867E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.588E+02
Pa-231	1.366E-07	5.152E+00	2.404E+00	3.687E-03	1.337E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.897E+00
Pb-210	1.143E-08	4.320E-01	3.256E-02	1.864E-02	1.119E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.950E-01
Pu-238	2.846E-09	1.075E-02	4.823E-04	8.120E-06	2.785E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.908E-02
Pu-239	7.459E-06	2.817E+01	1.264E+00	2.128E-02	7.298E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.024E+02
Pu-241	9.557E-27	3.609E-20	1.619E-21	2.727E-23	9.351E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.312E-19
Ra-226	1.214E-08	1.830E+00	1.165E-01	1.684E-01	1.188E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.234E+00
Se-79	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sn-126	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	2.418E-16	2.735E-07	1.206E-07	4.225E-08	2.366E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.387E-07
Tc-99	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-229	6.553E-07	2.475E+00	1.111E-01	9.351E-03	6.411E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.006E+00
Th-230	6.531E-08	2.466E-01	1.107E-02	9.319E-04	6.390E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.976E-01
U-233	6.521E-06	6.149E+01	4.431E+00	1.282E+01	6.379E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.425E+02
U-234	6.529E-06	6.157E+01	4.437E+00	1.284E+01	6.388E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.427E+02
U-235	6.527E-06	6.155E+01	4.435E+00	1.283E+01	6.385E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.427E+02
U-238	6.527E-06	6.155E+01	4.435E+00	1.283E+01	6.385E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.427E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
Radon and its Decay Products as pCi/yr at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 49
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.961E-07	0.0189	2.008E-12	0.0000	5.821E-08	0.0012	4.430E-10	0.0000	4.047E-10	0.0000	6.026E-08	0.0013
Am-241	1.923E-07	0.0040	3.980E-12	0.0000	5.342E-08	0.0011	1.199E-09	0.0000	8.072E-11	0.0000	1.384E-07	0.0029
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	3.370E-15	0.0000	2.330E-24	0.0000	1.173E-16	0.0000	2.242E-16	0.0000	8.638E-17	0.0000	7.614E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.057E-11	0.0000	4.097E-18	0.0000	6.223E-10	0.0000	3.209E-10	0.0000	6.792E-10	0.0000	8.067E-11	0.0000
Ni-63	0.000E+00	0.0000	1.296E-18	0.0000	4.026E-11	0.0000	1.242E-11	0.0000	7.135E-11	0.0000	2.090E-12	0.0000
Np-237	1.392E-05	0.2929	7.748E-12	0.0000	1.852E-06	0.0390	1.363E-07	0.0029	1.010E-09	0.0000	2.403E-07	0.0051
Pa-231	8.817E-08	0.0019	7.483E-13	0.0000	8.368E-08	0.0018	3.905E-08	0.0008	5.989E-11	0.0000	2.171E-08	0.0005
Pb-210	2.338E-10	0.0000	2.619E-14	0.0000	1.108E-07	0.0023	8.350E-09	0.0002	4.781E-09	0.0001	2.869E-08	0.0006
Pu-238	7.610E-13	0.0000	7.975E-15	0.0000	9.749E-11	0.0000	4.375E-12	0.0000	7.366E-14	0.0000	2.526E-10	0.0000
Pu-239	6.811E-09	0.0001	2.869E-11	0.0000	3.421E-07	0.0072	1.535E-08	0.0003	2.584E-10	0.0000	8.863E-07	0.0187
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	4.918E-07	0.0103	2.551E-14	0.0000	7.003E-08	0.0015	4.458E-09	0.0001	6.443E-09	0.0001	4.544E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.022E-17	0.0000	3.532E-24	0.0000	8.784E-16	0.0000	3.873E-16	0.0000	1.357E-16	0.0000	7.599E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	3.556E-06	0.0748	1.085E-11	0.0000	1.277E-07	0.0027	5.730E-09	0.0001	4.824E-10	0.0000	3.308E-07	0.0070
Th-230	2.535E-10	0.0000	1.603E-13	0.0000	2.118E-09	0.0000	9.505E-11	0.0000	8.003E-12	0.0000	5.488E-09	0.0001
U-233	2.913E-08	0.0006	1.282E-11	0.0000	4.139E-07	0.0087	2.983E-08	0.0006	8.629E-08	0.0018	4.294E-07	0.0090
U-234	7.579E-09	0.0002	1.261E-11	0.0000	4.085E-07	0.0086	2.943E-08	0.0006	8.516E-08	0.0018	4.238E-07	0.0089
U-235	1.609E-05	0.3386	1.134E-11	0.0000	4.175E-07	0.0088	3.008E-08	0.0006	8.704E-08	0.0018	4.331E-07	0.0091
U-238	3.314E-06	0.0697	1.071E-11	0.0000	5.157E-07	0.0109	3.716E-08	0.0008	1.075E-07	0.0023	5.350E-07	0.0113
Total	3.859E-05	0.8121	1.017E-10	0.0000	4.457E-06	0.0938	3.378E-07	0.0071	3.803E-07	0.0080	3.538E-06	0.0745

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 50
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Plant		Meat		Milk		All Pathways**	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-06	0.0214
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.854E-07	0.0081
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.805E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	5.874E-08	0.0012	4.489E-08	0.0009	1.147E-07	0.0024	2.201E-07	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.261E-10	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.615E-05	0.3398
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.327E-07	0.0049
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-07	0.0032
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.553E-10	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-06	0.0263
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.773E-07	0.0121
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-15	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.021E-06	0.0846
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.962E-09	0.0002
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.886E-07	0.0208
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.545E-07	0.0201
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.706E-05	0.3589
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.509E-06	0.0949
Total	0.000E+00	0.0000	0.000E+00	0.0000	5.874E-08	0.0012	4.489E-08	0.0009	1.147E-07	0.0024	4.752E-05	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
Radon and its Decay Products at t= 1.000E+03 years

0

Radon Pathway	Radionuclides							
	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 51
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	1.889E-07	0.0040	3.849E-12	0.0000	0.000E+00	0.0000	5.204E-08	0.0011	1.188E-09	0.0000	7.828E-11	0.0000	1.338E-07	0.0028
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	3.370E-15	0.0000	2.330E-24	0.0000	0.000E+00	0.0000	1.173E-16	0.0000	2.242E-16	0.0000	8.638E-17	0.0000	7.614E-18	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	1.057E-11	0.0000	4.097E-18	0.0000	0.000E+00	0.0000	6.223E-10	0.0000	3.209E-10	0.0000	6.792E-10	0.0000	8.067E-11	0.0000
Ni-63	0.000E+00	0.0000	1.296E-18	0.0000	0.000E+00	0.0000	4.026E-11	0.0000	1.242E-11	0.0000	7.135E-11	0.0000	2.090E-12	0.0000
Np-237	1.392E-05	0.2930	7.812E-12	0.0000	0.000E+00	0.0000	1.854E-06	0.0390	1.364E-07	0.0029	1.315E-09	0.0000	2.424E-07	0.0051
Pu-238	1.449E-10	0.0000	1.265E-14	0.0000	0.000E+00	0.0000	2.990E-10	0.0000	1.881E-11	0.0000	3.439E-11	0.0000	4.186E-10	0.0000
Pu-239	6.829E-09	0.0001	2.869E-11	0.0000	0.000E+00	0.0000	3.421E-07	0.0072	1.535E-08	0.0003	2.585E-10	0.0000	8.863E-07	0.0187
Pu-241	6.507E-09	0.0001	1.327E-13	0.0000	0.000E+00	0.0000	1.793E-09	0.0000	4.091E-11	0.0000	2.698E-12	0.0000	4.613E-09	0.0001
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	1.022E-17	0.0000	3.532E-24	0.0000	0.000E+00	0.0000	8.784E-16	0.0000	3.873E-16	0.0000	1.357E-16	0.0000	7.599E-18	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	3.579E-06	0.0753	2.360E-11	0.0000	0.000E+00	0.0000	5.399E-07	0.0114	3.544E-08	0.0007	8.647E-08	0.0018	7.581E-07	0.0160
U-234	4.992E-07	0.0105	1.278E-11	0.0000	0.000E+00	0.0000	5.899E-07	0.0124	4.222E-08	0.0009	9.610E-08	0.0020	4.611E-07	0.0097
U-235	1.707E-05	0.3593	1.409E-11	0.0000	0.000E+00	0.0000	5.594E-07	0.0118	6.958E-08	0.0015	8.750E-08	0.0018	5.151E-07	0.0108
U-238	3.314E-06	0.0697	1.075E-11	0.0000	0.000E+00	0.0000	5.171E-07	0.0109	3.726E-08	0.0008	1.078E-07	0.0023	5.363E-07	0.0113
Total	3.859E-05	0.8121	1.017E-10	0.0000	0.000E+00	0.0000	4.457E-06	0.0938	3.378E-07	0.0071	3.803E-07	0.0080	3.538E-06	0.0745

RPP-RPT-58329, Rev. 3

RESRAD, Version 6.5 T« Limit = 180 days 11/27/2014 16:08 Page 52
Intrisk : Residual Dose and Risk Assessment for Yakama Resident
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\YAKAMA RESIDENT.RAD

Total Excess Cancer Risk CNRS(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Am-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.761E-07	0.0079
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.805E-15	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
I-129	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.874E-08	0.0012	4.489E-08	0.0009	1.147E-07	0.0024	2.201E-07	0.0046
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.261E-10	0.0000
Np-237	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.616E-05	0.3400
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.157E-10	0.0000
Pu-239	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.251E-06	0.0263
Pu-241	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.296E-08	0.0003
Se-79	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sn-126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.419E-15	0.0000
Tc-99	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.998E-06	0.1052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.688E-06	0.0355
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.830E-05	0.3852
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.513E-06	0.0950
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.874E-08	0.0012	4.489E-08	0.0009	1.147E-07	0.0024	4.752E-05	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

APPENDIX E

RESULTS OF SLERA

Table of Contents

Attachment E-1: Results of SLERA for Nonradiological COPECs E-1

Attachment E-2: Results of SLERA for Radiological COPECs E-12

APPENDIX E
ATTACHMENT E-1: Results of SLERA for Nonradiological COPECs

SLERA for Exposure Area A plus B

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening	
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}
Aluminum	7,860,000	7,860	11800	0.7	No Further Evaluation	
Antimony	342	0.3	5	0.1		
Arsenic	5,220	5.2	10	0.5		
Barium	100,000	100	132	0.8		
Cadmium	117	0.1	0.81	0.1		
Chromium	11,100	11.1	18.5	0.6		
Cobalt	11,400	11.4	15.7	0.7		
Copper	14,200	14.2	28	0.5		
Iron	26,200,000	26,200	NA	NE	NA	NE
Lead	7,210	7.2	11	0.7	No Further Evaluation	
Lithium	8,640	8.6	33.5	0.3		
Manganese	377,000	377	512	0.7		
Nickel	12,200	12.2	30	0.4		
Nitrate	16,100	16.1	52	0.3		
Nitrite	1,080	1.1	52	0.0		
Silver	52.5	0.05	2	0.0		
Strontium	45,000	45	NA	NE	4228	0.0
Thallium	137	0.1	1	0.1	No Further Evaluation	
Tin	11,600	11.6	50	0.2		
Total Uranium	732	0.7	100	0.0		
Vanadium	66,500	66.5	85.1	0.8		
Zinc	47,500	47.5	67.8	0.7		
Fluoride	2,750	2.8	2.81	0.98		
Chloride	5,650	5.7	100	0.1		
Sulfate	592,000	592	237	**2.5**	NA	NE
Diethylphthalate	340	0.3	NA	NE	NA	NE
Aroclor-1254	8.6	0.01	0.65	0.0	No Further Evaluation	

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area C

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening	
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}
Aluminum	9,510,000	9,510	11800	0.8	No Further Evaluation	
Antimony	721	0.7	5	0.1		
Arsenic	21,200	21.2	10	**2.1**	105	0.20
Barium	98,800	98.8	132	0.7	No Further Evaluation	
Beryllium	403	0.4	10	0.0		
Cadmium	150	0.2	0.81	0.2		
Chromium	12,800	12.8	18.5	0.7		
Cobalt	11,000	11	15.7	0.7		
Copper	18,100	18.1	28	0.6		
Iron	28,600,000	28,600	NA	NE	NA	NE
Lead	10,600	10.6	11	0.96	No Further Evaluation	
Lithium	12,100	12.1	33.5	0.4		
Manganese	449,000	449	512	0.9		
Mercury	5.1	0.01	0.33	0.0		
Nickel	13,000	13	30	0.4		
Silver	80.0	0.08	2	0.0		
Strontium	44,700	44.7	NA	NE	4228	0.0
Thallium	304	0.3	1	0.3	No Further Evaluation	
Total Uranium	845	0.8	100	0.0		
Vanadium	78,500	78.5	85.1	0.9		
Zinc	51,100	51.1	67.8	0.8		
Chloride	1,430	1.4	100	0.0		
Fluoride	2,290	2.3	2.81	0.8		
Nitrate	17,400	17.4	52	0.3		
Nitrite	2,110	2.1	52	0.0		
Sulfate	27,700	27.7	237	0.1		
Butylbenzylphthalate	80.7	0.08	NA	NE	NA	NE

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area E

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{LOAEL}
Aluminum	7,420,000	7,420	11800	0.6	No Further Evaluation			
Antimony	178	0.2	5	0.0				
Arsenic	5,200	5.2	10	0.5				
Barium	78,400	78.4	132	0.6				
Beryllium	159	0.2	10	0.0				
Boron	3,340	3.3	3.62	0.9				
Cadmium	3,260	3.3	0.81	**4.0**	0.9	**3.62**	2.0	**1.63**
Chromium	17,200	17.2	18.5	0.9	No Further Evaluation			
Cobalt	8,820	8.8	15.7	0.6				
Copper	16,500	16.5	28	0.6				
Iron	########	24,200	NA	NE	NA	NE	NA	NE
Lithium	9,130	9.1	33.5	0.3	No Further Evaluation			
Manganese	495,000	495	512	0.97				
Mercury	23.2	0.02	0.33	0.1				
Nickel	12,400	12.4	30	0.4				
Selenium	560	0.6	0.78	0.7				
Silver	85.0	0.1	2	0.0				
Strontium	34,700	34.7	--	--	4228	0.0	No Further Evaluation	
Thallium	80.1	0.08	1	0.1	No Further Evaluation			
Total Uranium	827	0.8	100	0.0				
Vanadium	58,800	58.8	85.1	0.7				
Zinc	44,800	44.8	67.8	0.7				
Chloride	563	0.6	100	0.0				
Fluoride	1,480	1.5	2.81	0.5				
Nitrate	5,020	5.0	52	0.1				
Nitrite	1,400	1.4	52	0.0				
Sulfate	30,500	30.5	237	0.1				
Acetone	6.6	0.01	NA	NE	NA	NE	NA	NE
Butylbenzylphthalate	124	0.12	NA	NE	NA	NE	NA	NE
Toluene	0.34	3.E-04	200	0.0	No Further Evaluation			
Aldrin	2.0	2.E-03	0.1	0.0				

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area F plus G

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening	
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}
Aluminum	7,440,000	7,440	11800	0.6	No Further Evaluation	
Antimony	262	0.3	5	0.1		
Arsenic	4,300	4.3	10	0.4		
Barium	129,000	129	132	0.98		
Beryllium	298	0.3	10	0.0		
Cadmium	143	0.1	0.81	0.2		
Chromium	9,720	9.7	18.5	0.5		
Cobalt	8,760	8.8	15.7	0.6		
Copper	15,600	15.6	28	0.6		
Iron	25,900,000	25,900	NA	NE	NA	NE
Lead	8,480	8.5	11	0.8	No Further Evaluation	
Lithium	7,910	7.9	33.5	0.2		
Manganese	500,000	500	512	0.98		
Mercury	30.4	0.03	0.33	0.1		
Nickel	12,400	12.4	30	0.4		
Silver	81.8	0.1	2	0.0		
Strontium	49,700	49.7	NA	NE	4228	0.0
Tin	6,360	6.4	50	0.1	No Further Evaluation	
Total Uranium	1,019	1.0	100	0.0		
Vanadium	78,500	78.5	85.1	0.9		
Zinc	43,100	43.1	67.8	0.6		
Chloride	1,080	1.1	100	0.0		
Fluoride	3,290	3.3	2.81	**1.2**	2281	0.00
Nitrate	11,400	11.4	52	0.2	No Further Evaluation	
Nitrite	4,080	4.1	52	0.1		
Sulfate	27,500	27.5	237	0.1		
2-Butanone	2.5	3.E-03	NA	NE	193	0.00
Bis(2-ethylhexyl) phthalate	7,420	7.42	100	0.1	No Further Evaluation	
Butylbenzylphthalate	72.6	7.E-02	NA	NE	NA	NE
Hexane	35.9	4.E-02	NA	NE	NA	NE
Methylene chloride	2.0	2.E-03	NA	NE	59	0.00
o-Xylene	0.13	1.E-04	NA	NE	NA	NE
Styrene	0.65	7.E-04	NA	NE	NA	NE
Toluene	1.0	1.E-03	200	0.0	No Further Evaluation	
Xylenes (total)	0.46	5.E-04	NA	NE	149	0.00
beta-BHC	25.3	3.E-02	6	0.0	No Further Evaluation	
Gamma-BHC (Lindane)	5.1	5.E-03	6	0.0		
Aroclor-1260	20.6	2.E-02	0.65	0.0		

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area H plus I

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening	
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}
Aluminum	7,730,000	7,730	11800	0.7	No Further Evaluation	
Antimony	420	0.4	5	0.1		
Arsenic	7,000	7	10	0.7		
Barium	103,000	103	132	0.8		
Beryllium	212	0.2	10	0.0		
Cadmium	196	0.2	0.81	0.2		
Chromium	26,800	26.8	18.5	**1.4**	37	0.72
Cobalt	11,300	11.3	15.7	0.7	No Further Evaluation	
Copper	13,500	13.5	28	0.5		
Iron	31,200,000	31,200	NA	NE	NA	NE
Lead	11,300	11.3	11	**1.03**	16	0.71
Lithium	8,010	8.0	33.5	0.2	No Further Evaluation	
Manganese	465,000	465	512	0.9		
Molybdenum	2,000	2	6	0.3		
Nickel	18,300	18.3	30	0.6		
Selenium	1,000	1	0.78	**1.3**	2	0.50
Silver	66.7	0.07	2	0.0	No Further Evaluation	
Strontium	37,700	37.7	NA	NE	4228	0.0
Thallium	194	0.2	1	0.2	No Further Evaluation	
Total Uranium	578	0.6	100	0.0		
Vanadium	82,600	82.6	85.1	1.0		
Zinc	53,000	53	67.8	0.8		
Chloride	36,300	36	100	0.4		
Fluoride	2,100	2.1	2.81	0.7		
Nitrate	54,600	54.6	52	**1.1**	340361	0.00
Nitrite	1,850	1.9	52	0.0	No Further Evaluation	
Sulfide	28,900	28.9	237	0.1		
Butylbenzylphthalate	200	0.2	NA	NE	NA	NE
Di-n-butylphthalate	570	0.6	NA	NE	NA	NE
Styrene	0.46	5E-04	NA	NE	NA	NE
Toluene	1.1	1E-03	200	0.0	No Further Evaluation	

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area J

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration / SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration / SSL_{LOAEL}
Aluminum	7,740,000	7,740	11800	0.7	No Further Evaluation			
Antimony	2,160	2.2	5	0.4				
Arsenic	7,890	7.9	10	0.8				
Barium	244,000	244	132	**1.8**	660	0.37	No Further Evaluation	
Beryllium	328	0.3	10	0.0	No Further Evaluation			
Boron	43,900	43.9	3.62	**12.1**	40	**1.10**	133	0.33
Cadmium	113	0.1	0.81	0.1	No Further Evaluation			
Chromium	11,600	11.6	18.5	0.6				
Cobalt	8,270	8.3	15.7	0.5				
Copper	13,800	13.8	28	0.5				
Iron	24,100,000	24,100	NA	NE	NA	NE	NA	NE
Lead	5,290	5.3	11	0.5	No Further Evaluation			
Lithium	8,680	8.7	33.5	0.3				
Manganese	383,000	383	512	0.7				
Mercury	16.2	0.02	0.33	0.0				
Nickel	13,700	13.7	30	0.5				
Silver	62.4	0.06	2	0.0				
Strontium	125,000	125	NA	NE	4228	0.0		
Thallium	82.3	0.08	1	0.1	No Further Evaluation			
Tin	3,600	3.6	50	0.1				
Total Uranium	650	0.7	100	0.0				
Vanadium	54,300	54.3	85.1	0.6				
Zinc	52,300	52.3	67.8	0.8				
Chloride	3,140	3.1	100	0.0				
Fluoride	1,530	1.5	2.81	0.5				
Nitrate	9,230	9.2	52	0.2				
Nitrite	2,500	2.5	52	0.0				
Sulfate	44,100	44.1	237	0.2				
Bis(2-ethylhexyl) phthalate	2,070	2.1	100	0.0				
Butylbenzylphthalate	77.8	0.08	NA	NE	NA	NE	NA	NE

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area L1 plus L2

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration / SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration / SSL_{LOAEL}
Aluminum	7,070,000	7,070	11800	0.6	No Further Evaluation			
Antimony	500	0.5	5	0.1				
Arsenic	4,520	4.5	10	0.5				
Barium	106,000	106	132	0.8				
Beryllium	216	0.2	10	0.0				
Cadmium	120	0.1	0.81	0.1				
Chromium	11,100	11.1	18.5	0.6				
Cobalt	10,700	10.7	15.7	0.7				
Copper	15,100	15.1	28	0.5				
Iron	25,900,000	25,900	NA	NE	NA	NE	NA	NE
Lead	6,430	6.4	11	0.6	No Further Evaluation			
Lithium	7,440	7.4	33.5	0.2				
Manganese	450,000	450	512	0.9				
Mercury	17.1	0.02	0.33	0.1				
Molybdenum	2,450	2.5	6	0.4				
Nickel	18,400	18.4	30	0.6				
Selenium	1,350	1.4	0.78	**1.7**	1	**1.13**	2	0.68
Silver	102	0.1	2	0.1				
Strontium	33,300	33.3	NA	NE	4228	0.0	No Further Evaluation	
Total Uranium	980	1.0	100	0.0	No Further Evaluation			
Vanadium	71,600	71.6	85.1	0.8				
Zinc	43,400	43.4	67.8	0.6				
Chloride	1,920	1.9	1000	0.0				
Fluoride	1,660	1.7	2.81	0.6				
Nitrate	12,000	12	52	0.2				
Nitrite	5,180	5.2	52	0.1				
Sulfate	9,620	9.6	237					
1-Butanol	22.2	0.02	NA	NE	2626	0.0	No Further Evaluation	
Acetone	46.2	0.05	NA	NE	NA	NE	NA	NE
Bis(2-ethylhexyl) phthalate	1,840	1.8	100	0.0	No Further Evaluation			
Butylbenzylphthalate	59.2	0.06	NA	NE	NA	NE	NA	NE
Hexane	60.5	0.06	NA	NE	NA	NE	NA	NE
beta-BHC	23.4	0.02	6	0.0	No Further Evaluation			

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area P

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration / Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration / SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{LOAEL}
Aluminum	7,800,000	7,800	11800	0.7	No Further Evaluation			
Antimony	367	0.4	5	0.1				
Arsenic	5,900	5.9	10	0.6				
Barium	86,100	86.1	132	0.7				
Beryllium	315	0.3	10	0.0				
Cadmium	145	0.1	0.81	0.2				
Chromium	21,800	21.8	18.5	**1.2**	37	0.59	No Further Evaluation	
Cobalt	9,900	9.9	15.7	0.6	No Further Evaluation			
Copper	13,200	13.2	28	0.5				
Iron	30,500,000	30,500	NA	NE	NA	NE	NA	NE
Lead	8,060	8.1	11	0.7	No Further Evaluation			
Lithium	9,420	9.4	33.5	0.3				
Manganese	385,000	385	512	0.8				
Mercury	19.2	0.02	0.33	0.1				
Nickel	13,900	13.9	30	0.5				
Silver	223	0.2	2	0.1				
Strontium	39,100	39.1	NA	NE	4228	0.0	No Further Evaluation	
Thallium	144	0.1	1	0.1	No Further Evaluation			
Tin	14,400	14.4	50	0.3				
Total Uranium	2,634	2.6	100	0.0				
Vanadium	110,000	110	85.1	**1.3**	16	**6.9**	31	**3.5**
Zinc	305,000	305	67.8	**4.5**	67	**4.6**	68	**4.5**
Chloride	3,710	3.7	100	0.0	No Further Evaluation			
Fluoride	4,760	4.8	2.81	**1.7**	556	0.01	No Further Evaluation	
Nitrate	17,500	17.5	52	0.3	No Further Evaluation			
Nitrite	5,760	5.8	52	0.1				
Sulfate	41,700	41.7	237	0.0				
Acetone	13.1	0.01	NA	NE	NA	NE	NA	NE
Bis(2-ethylhexyl) phthalate	2,300	2.3	100	0.0	No Further Evaluation			
Di-n-butylphthalate	863	0.9	NA	NE	NA	NE	NA	NE
Methylene chloride	2.6	3.E-03	NA	NE	59	0.0	No Further Evaluation	
Toluene	0.29	3.E-04	200	0.0	No Further Evaluation			
beta-BHC	25.8	0.03	6	0.0				
Aroclor-1260	26.8	0.03	0.65	0.0				

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area R

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{LOAEL}
Aluminum	8,390,000	8,390	11800	0.7	No Further Evaluation			
Antimony	245	0.2	5	0.0				
Arsenic	5,830	5.8	10	0.6				
Barium	79,200	79.2	132	0.6				
Beryllium	175	0.2	10	0.0				
Cadmium	3,470	3.5	0.81	**4.3**	0.9	**3.86**	2	**1.74**
Chromium	11,200	11.2	18.5	0.6	No Further Evaluation			
Cobalt	10,500	10.5	15.7	0.7				
Copper	14,800	14.8	28	0.5				
Iron	25,900,000	25,900	NA	NE	NA	NE	NA	NE
Lead	8,450	8.5	11	0.8	No Further Evaluation			
Lithium	9,050	9.1	33.5	0.3				
Manganese	409,000	409	512	0.8				
Mercury	13.5	0.01	0.33	0.0				
Nickel	11,000	11	30	0.4				
Selenium	701	0.7	0.78	0.9				
Silver	69.4	0.07	2	0.0				
Strontium	37,300	37.3	NA	NE	4228	0.0	No Further Evaluation	
Total Uranium	660	0.7	100	0.0	No Further Evaluation			
Vanadium	64,200	64.2	85.1	0.8				
Zinc	48,600	48.6	67.8	0.7				
Chloride	1,300	1.3	100	0.0				
Fluoride	3,530	3.5	2.81	**1.3**	556	0.01	No Further Evaluation	
Nitrate	39,700	39.7	52	0.8	No Further Evaluation			
Nitrite	5,310	5.3	52	0.1				
Sulfate	7,830	7.8	237	0.0				
2-Hexanone	2.8	3.E-03	NA	NE	186	0.00	No Further Evaluation	
Acetone	6.4	0.01	NA	NE	NA	NE	NA	NE
Butylbenzylphthalate	107	0.1	NA	NE	NA	NE	NA	NE
Methylene chloride	1.4	1.E-03	NA	NE	59	0.0	No Further Evaluation	
Toluene	0.59	6.E-04	200	0.0	No Further Evaluation			

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

SLERA for Exposure Area U

COPECs	Maximum Detected Concentration		Generic Screening		Tier 1 Screening			
	ug/kg	mg/kg	Literature-derived Generic SSL (mg/kg)	HQ = Maximum Detected Concentration/ Generic SSL	SSL_{NOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{NOAEL}	SSL_{LOAEL} (mg/kg)	HQ = Maximum Detected Concentration/ SSL_{LOAEL}
Aluminum	8,270,000	8,270	11800	0.70	No Further Evaluation			
Antimony	291	0.3	5	0.06				
Arsenic	7,000	7	10	0.70				
Barium	96,900	96.9	132	0.73				
Beryllium	235	0.2	10	0.02				
Boron	6,420	6.4	3.62	**1.77**	40	0.16	No Further Evaluation	
Chromium	10,000	10	18.5	0.54	No Further Evaluation			
Cobalt	8,730	8.7	15.7	0.56				
Copper	13,200	13.2	28	0.47				
Iron	23,100,000	23,100	NA	NE	NA	NE	NA	NE
Lead	7,000	7	11	0.64	No Further Evaluation			
Lithium	9,240	9.2	33.5	0.28				
Manganese	364,000	364	512	0.71				
Mercury	20.6	0.02	0.33	0.06				
Molybdenum	2,530	2.5	6	0.42				
Nickel	9,800	9.8	30	0.33				
Selenium	2,000	2	0.78	**2.56**	1.2	**1.67**	2	1.00
Strontium	49,600	49.6	NA	NE	4228	0.0	No Further Evaluation	
Total Uranium	618	0.6	100	0.01	No Further Evaluation			
Vanadium	51,900	51.9	85.1	0.61				
Zinc	45,300	45.3	67.8	0.67				
Chloride	1,510	1.5	100	0.02				
Fluoride	2,020	2.0	2.81	0.72				
Nitrate	8,510	8.5	52	0.16				
Nitrite	2,190	2.2	52	0.04				
Sulfate	9,940	9.9	237	0.04				
Acetone	6.2	0.01	NA	NE	NA	NE	NA	NE
Benzene	0.33	3.E-04	NA	NE	7	0.00	No Further Evaluation	
Styrene	0.38	4.E-04	NA	NE	NA	NE	NA	NE
Toluene	0.74	7.E-04	200	0.00	No Further Evaluation			

Footnote

NA = Not Available

NE = Not Evaluated due to no SSL

APPENDIX E
ATTACHMENT E-2: Results of SLERA for Radiological COPECs

SLERA for Exposure Areas A plus B

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening		Tier 1 Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value	LOAEL Based PRG (pCi/g)	Ratio = Maximum Detected Concentration/ LOAEL Based PRG
Am-241	0.18	3.89E+03	4.63E-05	4840	3.72E-05
C-14	3.4	4.76E+03	7.14E-04	32	1.06E-01
Cs-137	27.7	2.08E+01	1.33E+00	924	3.00E-02
Pu-239	0.31	6.11E+03	5.07E-05	6270	4.94E-05
Pu-241	1.2	NA	NC	NA	NC
Se-79	2.7	NA	NC	NA	NC
Sn-126	47	NA	NC	NA	NC
Sr-90	24	2.25E+01	1.07E+00	91	2.64E-01
U-234	0.33	5.13E+03	6.43E-05	6370	5.18E-05
U-235	0.011	2.77E+03	3.97E-06	4360	2.52E-06
U-238	0.24	1.58E+03	1.52E-04	5150	4.66E-05
		Sum-of-the-Fractions	**2.4E+00**	**Sum-of-the-Fractions**	4.00E-01

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Area C

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
Cs-137	7.1	2.08E+01	3.41E-01
Ni-63	4.5	NA	NC
Sn-126	53.1	NA	NC
Sr-90	3	2.25E+01	1.33E-01
U-235	0.013	2.77E+03	4.69E-06
U-238	0.28	1.58E+03	1.77E-04
		Sum-of-the-Fractions	4.75E-01

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Area E

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
Cs-137	5.1	2.08E+01	2.45E-01
Se-79	3.8	NA	NC
Sn-126	18.5	NA	NC
Sr-90	2.5	2.25E+01	1.11E-01
U-233	2	4.83E+03	4.14E-04
U-234	0.45	5.13E+03	8.77E-05
U-235	0.012	2.77E+03	4.33E-06
U-238	0.28	1.58E+03	1.77E-04
		Sum-of-the-Fractions	**3.6E-01**

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Areas F plus G

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
C-14	12.5	4.76E+03	2.63E-03
Cs-137	4.8	2.08E+01	2.31E-01
Se-79	2.4	NA	NC
Sn-126	2.6	NA	NC
Sr-90	0.3	2.25E+01	1.33E-02
U-233	2.2	4.83E+03	4.55E-04
U-234	0.42	5.13E+03	8.19E-05
U-235	0.015	2.77E+03	5.42E-06
U-238	0.34	1.58E+03	2.15E-04
		Sum-of-the-Fractions	2.47E-01

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Areas H plus I

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
C-14	3.5	4.76E+03	7.35E-04
H-3	75.8	1.74E+05	4.36E-04
Se-79	2.7	NA	NC
Sn-126	9.8	NA	NC
U-233	2	4.83E+03	4.14E-04
U-234	0.35	5.13E+03	6.82E-05
U-235	0.0081	2.77E+03	2.92E-06
U-238	0.19	1.58E+03	1.20E-04
		Sum-of-the-Fractions	1.78E-03

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Area J

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
C-14	13.7	4.76E+03	2.88E-03
Cs-137	5.7	2.08E+01	2.74E-01
Pu-238	0.067	5.27E+03	1.27E-05
Pu-239	0.038	6.11E+03	6.22E-06
Pu-241	0.14	NA	NC
Se-79	11.3	NA	NC
Sr-90	4	2.25E+01	1.78E-01
U-235	0.01	2.77E+03	3.61E-06
U-238	0.22	1.58E+03	1.39E-04
		Sum-of-the-Fractions	4.55E-01

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Areas L1 plus L2

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
C-14	53.8	4.76E+03	1.13E-02
Cs-137	7.5	2.08E+01	3.61E-01
H-3	4.7	1.74E+05	2.70E-05
Ni-63	390	NA	NC
Se-79	1.6	NA	NC
Sn-126	8.9	NA	NC
Sr-90	4	2.25E+01	1.78E-01
U-233	2.1	4.83E+03	4.35E-04
U-234	0.29	5.13E+03	5.65E-05
U-235	0.014	2.77E+03	5.05E-06
U-238	0.33	1.58E+03	2.09E-04
		Sum-of-the-Fractions	5.50E-01

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Area P

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening		Tier 1 Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value	LOAEL Based PRG	Ratio = Maximum Detected Concentration/ LOAEL Based PRG
Am-241	2.2	3.89E+03	5.66E-04	4.84E+03	4.55E-04
Co-60	0.83	6.92E+02	1.20E-03	805	1.03E-03
Cs-137	**73.1**	2.08E+01	**3.51E+00**	9.24E+02	**7.91E-02**
H-3	308	1.74E+05	1.77E-03	420	**7.3E-01**
I-129	0.81	5.67E+03	1.43E-04	NA	NC
Ni-63	85	NA	NC	NA	NC
Np-237	1.5	3.86E+03	3.89E-04	7880	1.90E-04
Pu-239	10.7	6.11E+03	1.75E-03	6.27E+03	1.71E-03
Pu-241	39.9	NA	NC	NA	NC
Se-79	8.7	NA	NC	NA	NC
Sr-90	**141**	2.25E+01	**6.27E+00**	9.10E+01	**1.5E+00**
Tc-99	24	4.49E+03	5.35E-03	5360	4.48E-03
U-233	2.6	4.83E+03	5.38E-04	NA	NC
U-234	1.4	5.13E+03	2.73E-04	6370	2.20E-04
U-235	0.043	2.77E+03	1.55E-05	4360	9.86E-06
U-238	0.88	1.58E+03	5.57E-04	5150	1.71E-04
		Sum-of-the-Fractions	**9.8**	**Sum-of-the-Fractions**	**2.4**

NA = Not Screening value is Available
NC = Not Calculated

SLERA for Exposure Area R

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
H-3	2.5	1.74E+05	1.44E-05
Sr-90	0.37	2.25E+01	1.64E-02
U-233	2.4	4.83E+03	4.97E-04
U-234	0.22	5.13E+03	4.29E-05
U-235	0.01	2.77E+03	3.61E-06
U-238	0.22	1.58E+03	1.39E-04
		Sum-of-the-Fractions	1.71E-02

SLERA for Exposure Area U

COPECs	Maximum Detected Concentration (pCi/g)	Generic Screening	
		Literature-derived Generic Screening Level (pCi/g)	Ratio = Maximum Detected Concentration/ Generic Screening Value
C-14	1.7	4.76E+03	3.57E-04
Cs-137	2.1	2.08E+01	1.01E-01
Np-237	0.6	3.86E+03	1.55E-04
Se-79	2.8	NA	NC
Sn-126	6.3	NA	NC
Sr-90	4.2	2.25E+01	1.87E-01
U-233	2.1	4.83E+03	4.35E-04
U-234	0.31	5.13E+03	6.04E-05
U-235	0.0089	2.77E+03	3.21E-06
U-238	0.21	1.58E+03	1.33E-04
		Sum-of-the-Fractions	2.89E-01

NA = Not Screening value is Available
NC = Not Calculated

Summary Results for SLERA at each EA

Exposure Areas	Sum-of-the-Fractions		DoseContributors
	Generic Screening	Tier 1 Screening	
A plus B	**2.4**	0.4	None
C	0.5	Not Evaluated	
E	0.4		
F plus G	0.2		
H plus I	0.002		
J	0.5		
L1 plus L2	0.6		
P	**9.8**	**2.4**	H-3 (31%, HQ = 0.7), Sr-90 (65%, HQ=1.5)
R	0.02	Not Evaluated	None
U	0.3		

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APPENDIX F

DIRECT EXPOSURE RADIOLOGICAL RISK EVALUATIONS USING SAMPLE-BY-SAMPLE APPROACH

Table of Contents

Attachment F-1: Sample Results for Radiological Contaminants F-1

Table F-1-1. Sample Concentrations for Radiological Contaminants at Exposure Area A + B. F-2

Table F-1-2. Sample Concentrations for Radiological Contaminants at Exposure Area C. F-3

Table F-1-3. Sample Concentrations for Radiological Contaminants at Exposure Area E. F-4

Table F-1-4. Sample Concentrations for Radiological Contaminants at Exposure Area F + G. F-5

Table F-1-5. Sample Concentrations for Radiological Contaminants at Exposure Area H + I. F-6

Table F-1-6. Sample Concentrations for Radiological Contaminants at Exposure Area J. F-7

Table F-1-7. Sample Concentrations for Radiological Contaminants at Exposure Area L1 + L2 ..... F-8

Table F-1-8. Sample Concentrations for Radiological Contaminants at Exposure Area P. F-9

Table F-1-9. Sample Concentrations for Radiological Contaminants at Exposure Area R. F-10

Table F-1-10. Sample Concentrations for Radiological Contaminants at Exposure Area U. F-11

Attachment F-2: Radiological Risk Assessment Results under CERCLA Industrial Worker Scenario F-12

Table F-2-1. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Industrial Worker Scenario. F-13

Table F-2-2. Radiological Risk Assessment Results for Exposure Area C under CERCLA Industrial Worker Scenario. F-14

Table F-2-3. Radiological Risk Assessment Results for Exposure Area E under CERCLA Industrial Worker Scenario. F-14

Table F-2-4. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Industrial Worker Scenario. F-15

Table F-2-5. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Industrial Worker Scenario. F-16

Table F-2-6. Radiological Risk Assessment Results for Exposure Area J under CERCLA Industrial Worker Scenario. F-17

Table F-2-7. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Industrial Worker Scenario. F-18

Table F-2-8. Radiological Risk Assessment Results for Exposure Area P under CERCLA Industrial Worker Scenario. F-19

Table F-2-9. Radiological Risk Assessment Results for Exposure Area R under CERCLA Industrial Worker Scenario. F-20

Table F-2-10. Radiological Risk Assessment Results for Exposure Area U under CERCLA Industrial Worker Scenario. F-20

Attachment F-3: Radiological Risk Assessment Results under CERCLA Residential Receptor Scenario F-21

Table F-3-1. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Residential Receptor Scenario. F-22

Table F-3-2. Radiological Risk Assessment Results for Exposure Area C under CERCLA Residential Receptor Scenario. F-23

Table F-3-3. Radiological Risk Assessment Results for Exposure Area E under CERCLA Residential Receptor Scenario. F-23

Table F-3-4. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Residential Receptor Scenario. F-24

Table F-3-5. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Residential Receptor Scenario. F-25

Table F-3-6. Radiological Risk Assessment Results for Exposure Area J under CERCLA Residential Receptor Scenario. F-26

Table F-3-7. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Residential Receptor Scenario. F-27

Table F-3-8. Radiological Risk Assessment Results for Exposure Area P under CERCLA Residential Receptor Scenario. F-28

Table F-3-9. Radiological Risk Assessment Results for Exposure Area R under CERCLA Residential Receptor Scenario. F-29

Table F-3-10. Radiological Risk Assessment Results for Exposure Area U under CERCLA Residential Receptor Scenario. F-29

ATTACHMENT F-1

SAMPLE RESULTS FOR RADIOLOGICAL CONTAMINANTS

Table F-1-1. Sample Concentrations for Radiological Contaminants at Exposure Area A + B.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**									
Americium-241	--	0.0164	0.03	**0.06**	0.03	0.03	0.03	**0.04**	**0.18**	--
Carbon-14	--	**2.23**	1.23	**3.39**	2.24	0.93	**1.23**	0.92	1.01	--
Cesium-137	**4.37**	--	0.13	0.12	0.19	0.10	0.10	0.08	**27.70**	--
Cobalt-60	0.08	--	0.13	0.10	0.15	0.09	0.11	0.07	0.08	--
Europium-154	0.14	--	0.16	0.16	0.22	0.30	0.29	0.26	0.23	--
Europium-155	0.26	--	0.31	0.29	0.38	0.25	0.25	0.27	0.21	--
Iodine-129	0.87	--	0.84	1.03	1.87	1.01	1.00	2.21	--	0.89
Neptunium-237	--	0.321	0.31	0.33	0.31	0.32	0.31	0.32	0.31	--
Nickel-63	3.29	--	3.33	3.36	3.51	6.73	4.84	6.04	5.18	--
Plutonium-238	0.03	--	0.04	0.03	0.04	0.03	0.04	0.04	0.02	--
Plutonium-239/240	0.03	--	0.05	0.05	0.05	0.04	0.04	0.04	**0.31**	--
Plutonium-241	0.10	--	0.20	0.18	0.17	0.14	0.16	0.16	**1.17**	--
Selenium-79	1.23	--	1.36	1.15	1.57	1.37	2.66	**2.19**	**2.70**	--
Strontium-90	--	**24**	0.65	0.18	0.27	0.42	0.50	0.59	--	**11.80**
Technetium-99	--	9.58	9.15	9.14	10.30	9.63	9.20	9.15	--	9.08
Tin-126	**26**	--	**23.60**	**18.40**	**47**	**14.10**	**17.10**	**25.20**	**28.10**	--
Tritium	1.41	--	1.48	2.57	2.00	1.75	1.33	2.05	1.35	--
Uranium-233	--	8.79	8.58	8.99	8.51	8.73	8.55	8.68	8.35	--
Uranium-234	--	**0.18**	**0.24**	**0.25**	**0.24**	0.14	**0.17**	**0.19**	**0.33**	--
Uranium-235	--	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	--	**0.01**
Uranium-236	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	--
Uranium-238	--	**0.15**	**0.19**	**0.15**	**0.16**	**0.14**	**0.14**	**0.18**	--	**0.24**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-2. Sample Concentrations for Radiological Contaminants at Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**			
Americium-241	--	0.02	0.02	0.03
Carbon-14	0.62	--	0.95	0.81
Cesium-137	--	**7.09**	0.15	0.10
Cobalt-60	--	0.08	0.10	0.11
Europium-154	--	0.30	0.26	0.24
Europium-155	--	0.19	0.32	0.25
Iodine-129	1.26	--	0.79	1.46
Neptunium-237	0.33	--	0.32	0.32
Nickel-63	--	3.14	**4.5**	3.37
Plutonium-238	0.04	--	0.04	0.04
Plutonium-239/240	--	0.05	0.03	0.04
Plutonium-241	--	0.18	0.12	0.16
Selenium-79	1.22	--	1.14	1.08
Strontium-90	--	**3**	0.56	0.18
Technetium-99	--	9.77	9.84	9.92
Tin-126	--	**25**	**53.1**	**20.7**
Tritium	--	2.09	1.32	2.19
Uranium-233	8.94	--	8.84	8.68
Uranium-234	0.14	--	0.14	0.14
Uranium-235	**0.01**	--	**0.01**	**0.01**
Uranium-236	--	0.00	0.00	0.001
Uranium-238	**0.18**	--	**0.28**	**0.19**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-3. Sample Concentrations for Radiological Contaminants at Exposure Area E.

Well Name	**C7672**				
Sample ID	**B26C68**	**B26C70**	**B26C74**	**B26JK2**	**B26JK3**
Top (feet)	**5**	**10**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**				
Americium-241	0.62	0.52	0.51	0.41	--
Carbon-14	1.12	0.68	0.67	--	0.66
Cesium-137	0.49	0.46	0.41	**5.13**	--
Cobalt-60	0.38	0.34	0.32	--	0.31
Europium-154	1.24	1.08	0.99	--	0.98
Europium-155	0.64	0.61	0.53	--	0.50
Iodine-129	0.32	0.16	0.16	0.15	--
Neptunium-237	0.28	0.28	0.28	0.28	--
Nickel-63	4.89	8.92	4.16	2.63	--
Plutonium-238	0.40	0.27	0.37	--	0.32
Plutonium-239/240	0.40	0.27	0.37	--	0.32
Plutonium-241	1.48	1.02	1.39	--	1.20
Selenium-79	**1.64**	**3.77**	**1.58**	**2.15**	--
Strontium-90	0.67	0.22	0.25	**2.5**	--
Technetium-99	2.55	2.51	2.57	--	2.55
Tin-126	**5.84**	**3.75**	**3.76**	**18.5**	--
Tritium	1.34	1.35	1.36	--	1.33
Uranium-233	**2.00**	**1.72**	**1.59**	--	**1.95**
Uranium-234	**0.19**	0.12	**0.45**	--	**0.24**
Uranium-235	**0.01**	**0.01**	**0.01**	--	**0.01**
Uranium-236	0.001	0.001	0.001	0.001	--
Uranium-238	**0.20**	**0.19**	**0.28**	--	**0.24**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-4. Sample Concentrations for Radiological Contaminants at Exposure Area F + G.

Well Name	**C7468**					**C7472**				
Sample ID	**B211Y3**	**B211Y6**	**B211Y9**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B238H1**	**B23KT4**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**0**	**0**	**5**	**14**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**1**	**1**	**7**	**16**	**14**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**									
Americium-241	0.92	0.94	1.09	1.01	--	--	0.49	0.48	0.41	0.48
Carbon-14	49.80	48.60	52.50	49.00	--	**3.51**	--	2.72	**6.07**	**12.5**
Cesium-137	0.39	0.38	0.31	**4.75**	--	--	**2.07**	0.36	0.40	0.39
Cobalt-60	0.30	0.28	0.24	--	0.26	0.24	--	0.28	0.36	0.29
Europium-154	0.88	0.97	0.82	--	0.88	0.81	--	0.88	1.02	0.93
Europium-155	0.49	0.48	0.42	--	0.47	0.44	--	0.47	0.52	0.48
Iodine-129	1.77	0.13	0.17	0.25	--	0.22	--	0.17	0.20	0.21
Neptunium-237	0.13	0.15	0.13	--	0.13	0.16	--	0.16	0.13	0.13
Nickel-63	48.40	50.60	49.50	--	49.10	--	4.61	5.05	3.18	5.07
Plutonium-238	0.56	0.54	0.67	0.59	--	--	0.34	0.24	0.30	0.32
Plutonium-239/240	0.56	0.54	0.67	0.59	--	--	0.34	0.24	0.30	0.32
Plutonium-241	2.10	2.03	2.51	2.19	--	--	1.26	0.91	1.12	1.19
Selenium-79	2.82	1.67	1.61	--	1.36	--	1.38	**2.42**	1.26	1.73
Strontium-90	4.06	3.64	3.71	1.99	--	**0.30**	--	0.75	**0.30**	0.23
Technetium-99	19	20.20	19.80	--	19.20	5.27	--	5.27	17.40	19.30
Tin-126	9.15	9.72	9.55	--	9.22	**2.55**	--	2.36	8.39	9.33
Tritium	450	550	484	--	285	2.27	--	2.41	2.43	3.32
Uranium-233	**1.06**	**0.62**	**0.75**	**2.21**	--	**1.20**	--	**1.35**	**0.94**	**0.77**
Uranium-234	0.12	**0.18**	**0.18**	**0.26**	--	--	**0.30**	**0.42**	0.11	0.11
Uranium-235	**0.01**	**0.01**	**0.01**	**0.01**	--	**0.01**	--	**0.01**	**0.01**	**0.01**
Uranium-236	0.00	0.001	0.001	--	0.001	--	0.001	0.001	0.001	0.00
Uranium-238	**0.15**	**0.13**	**0.14**	**0.26**	--	**0.17**	--	**0.34**	**0.16**	**0.15**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-5. Sample Concentrations for Radiological Contaminants at Exposure Area H + I.

Well Name	**C7680**					**C7682**				
Sample ID	**B26C26**	**B26C28**	**B26C30**	**B26JK8**	**B26JK9**	**B26C47**	**B26C51**	**B26C53**	**B26JL0**	**B26JL1**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**12**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**14**	**16**	**1**	**1**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**									
Americium-241	0.50	0.61	0.56	--	0.45	0.46	0.59	0.50	0.42	--
Carbon-14	1.41	1.39	1.29	--	1.39	**3.49**	1.31	2.54	--	1.32
Cesium-137	0.58	0.38	0.46	--	0.34	0.54	0.53	0.53	0.57	--
Cobalt-60	0.44	0.30	0.35	--	0.28	0.40	0.37	0.41	0.41	--
Europium-154	1.46	1.04	1.22	--	0.89	1.24	1.29	1.34	1.22	--
Europium-155	0.72	0.50	0.59	--	0.46	1.03	0.99	1.01	1.03	--
Iodine-129	0.15	0.15	0.22	0.14	--	0.18	0.16	0.14	--	0.15
Neptunium-237	0.28	0.28	0.28	--	0.28	0.28	0.28	0.28	--	0.28
Nickel-63	4.70	5.93	5.42	--	5.74	4.32	5.73	5.50	4.65	
Plutonium-238	0.29	0.32	0.34	0.31	--	0.29	0.35	0.33	--	0.26
Plutonium-239/240	0.29	0.32	0.34	0.31	--	0.29	0.35	0.33	--	0.26
Plutonium-241	1.07	1.20	1.27	1.15	--	1.09	1.32	1.23	--	0.97
Selenium-79	**2.23**	**2.65**	1.99	--	1.95	2.64	2.99	2.15	--	1.38
Strontium-90	0.57	0.24	0.19	0.19		0.18	0.19	0.18	--	0.21
Technetium-99	5.08	5.06	5.05	--	5.13	5.13	5.13	5.10	--	5.03
Tin-126	**6.77**	2.43	**3.89**	--	**7.24**	**8.54**	**3.42**	**5.42**	--	**9.76**
Tritium	62.30	63.70	51.00	**75.8**	--	4.03	**2.93**	**5.06**	--	**2.91**
Uranium-233	**1.38**	**0.58**	**1.36**	**1.44**	--	**1.97**	**1.04**	**1.29**	**1.81**	
Uranium-234	**0.26**	**0.30**	0.12	**0.35**	--	0.12	0.12	0.12	--	0.12
Uranium-235	**0.01**	**0.01**	**0.01**	**0.01**	--	**0.01**	**0.01**	**0.01**	--	**0.01**
Uranium-236	0.001	0.002	0.001		0.001	0.001	0.001	0.002	--	0.001
Uranium-238	**0.18**	**0.16**	**0.17**	**0.16**	--	**0.16**	**0.17**	**0.19**	--	**0.19**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-6. Sample Concentrations for Radiological Contaminants at Exposure Area J.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**			
Americium-241	0.05	--	0.04	0.05
Carbon-14	--	**13.70**	3.39	3.06
Cesium-137	--	**5.71**	0.08	0.08
Cobalt-60	0.08	--	0.10	0.09
Europium-154	0.15	--	0.14	0.15
Europium-155	0.29	--	0.28	0.27
Iodine-129	--	0.20	2.63	2.30
Neptunium-237	0.64	--	0.68	0.67
Nickel-63	6.24	--	10.50	4.87
Plutonium-238	--	**0.07**	0.03	0.04
Plutonium-239/240	**0.04**	--	0.03	0.04
Plutonium-241	**0.14**	--	0.12	0.15
Selenium-79	--	**11.30**	**3.76**	**5.19**
Strontium-90	--	**4.01**	0.75	0.69
Technetium-99	9.77	--	9.77	9.65
Tin-126	--	11.90	12.20	11.90
Tritium	--	2.60	3.52	2.67
Uranium-233	17.60	--	18.50	18.40
Uranium-234	0.28	--	0.30	0.30
Uranium-235	**0.01**	--	**0.01**	**0.01**
Uranium-236	0.002	--	0.002	0.002
Uranium-238	**0.22**	--	**0.19**	**0.19**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-7. Sample Concentrations for Radiological Contaminants at Exposure Area L1 + L2.

Well Name	C7466					C7670				
Sample ID	**B20XW6**	**B20XW9**	**B20XX2**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KP6**	**B23R25**	**B25CN2**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**0**	**14**	**0**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**1**	**16**	**1**	**14**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**									
Americium-241	0.95	1.03	1.15	0.90	--	0.50	--	0.47	0.41	0.61
Carbon-14	**53.80**	43.80	60.40	**43.7**	--	2.71	--	**4.69**	2.58	3.17
Cesium-137	**0.44**	0.25	0.23	--	**2.46**	0.34	--	0.33	**7.52**	0.33
Cobalt-60	0.18	0.21	0.19	--	0.16	0.30	--	0.26	0.33	0.23
Europium-154	0.63	0.68	0.61	--	0.54	0.87	--	0.84	1.02	0.82
Europium-155	0.38	0.42	0.38	--	0.34	0.45	--	0.45	0.57	0.43
Iodine-129	0.13	0.13	0.12	0.13	--	0.23	--	0.27	0.17	0.27
Neptunium-237	0.15	0.15	0.13	--	0.14	0.29	0.16	0.16	--	0.15
Nickel-63	70.60	51.70	52.20	--	49.60	13.40	**390**	21	--	16.50
Plutonium-238	0.60	0.61	0.67	0.58	--	0.23	0.25	0.26	--	0.24
Plutonium-239/240	0.60	0.61	0.67	0.58	--	0.23	0.25	0.26	--	0.24
Plutonium-241	2.25	2.28	2.51	2.17	--	0.85	0.92	0.97	--	0.89
Selenium-79	2.31	**1.60**	2.68	1.54	--	1.50	--	1.06	0.89	2.40
Strontium-90	2.97	1.78	1.82	--	**4.01**	**0.12**	**1.45**	0.34	--	0.29
Technetium-99	25.10	21.70	24.80	21.60	--	5.41	5.61	5.39	--	5.25
Tin-126	8.87	8.64	8.94	--	9.38	2.47	**3.44**	**8.94**	--	2.37
Tritium	306	268	291	263	--	**4.65**	--	3.85	3.89	4.94
Uranium-233	**1.21**	**0.44**	**0.57**	--	**1.25**	**1.11**	**2.08**	**0.94**	--	**1.52**
Uranium-234	**0.14**	0.12	**0.24**	**0.29**	--	0.13	**0.26**	**0.17**	--	0.13
Uranium-235	**0.01**	**0.005**	**0.01**	--	**0.01**	**0.01**	**0.01**	**0.01**	--	**0.01**
Uranium-236	0.001	0.001	0.001	--	0.001	0.001	--	0.001	0.001	0.001
Uranium-238	**0.25**	**0.11**	**0.14**	--	**0.19**	**0.15**	**0.33**	**0.14**	--	**0.13**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-8. Sample Concentrations for Radiological Contaminants at Exposure Area P.

Well Name	C6392	C6400		C6402			C6404		C6406		
Sample ID	B1YT71	B1YTH1	B1YTH3	B20XV5	B20XV9	B20XW3	B1YT92	B1YT93	B1YTC9	B1YTD2	B1YTD5
Top (feet)	14	5	10	6	10	14	6	10	5	10	14
Bottom (feet)	16	7	12	8	12	16	8	12	7	12	16
Contaminant of Potential Concern	Sample Concentration (pCi/g)										
Americium-241	**2.20**	0.90	1.05	1.77	1.01	1.18	1.15	1.97	1.03	1.80	0.85
Carbon-14	54.50	63.60	51.30	46.30	50.10	62.60	64.70	--	57.60	79.40	47.90
Cesium-137	**73.10**	**0.98**	**0.33**	**30.80**	**19.10**	**15.50**	**35**	--	3.01	3.08	0.52
Cobalt-60	**0.83**	0.21	0.20	3.13	0.20	0.74	0.66	--	2.68	3.00	0.43
Europium-154	0.89	0.69	0.63	8.57	0.68	2.05	1.92	--	8.10	9.45	1.21
Europium-155	0.78	0.43	0.42	6.70	0.51	1.18	1.26	--	5.44	6.05	1.05
Iodine-129	0.24	**0.81**	0.26	0.20	0.11	0.25	0.35	0.44	0.46	0.36	0.15
Neptunium-237	**1.46**	0.14	0.14	0.14	0.14	0.14	0.15	--	0.14	0.14	0.14
Nickel-63	68.50	84.40	**85**	84.10	40.80	43.20	45.70	94.20	58.20	112	106
Plutonium-238	1.10	0.57	0.57	1.11	0.63	0.60	0.75	1.47	0.64	1.48	0.69
Plutonium-239/240	**10.70**	0.57	0.57	1.11	0.63	0.60	0.75	1.47	0.64	1.48	0.69
Plutonium-241	**39.91**	2.13	2.12	4.14	2.36	2.22	2.80	5.48	2.37	5.52	2.58
Selenium-79	**2.50**	**2.84**	**4.69**	**8.69**	**1.98**	**5.17**	1.23	2.94	1.82	7.58	**2.05**
Strontium-90	**120**	**2.20**	3.44	**86.60**	**67.50**	**73.40**	**52.80**	**141**	**12.80**	8.79	3.43
Technetium-99	**24**	19.30	18.50	18.50	18.30	17.40	17.80	--	17.30	18.50	18.00
Tin-126	9.98	9.27	8.87	8.86	8.78	8.43	8.53	--	8.28	8.88	8.66
Tritium	415	293	**308**	262	269	442	294	--	298	287	323
Uranium-233	**1.30**	**0.75**	**1.69**	**1.62**	**2.01**	**2.57**	**0.98**	--	**1.20**	**2.27**	**1.32**
Uranium-234	**0.62**	**0.57**	**1.39**	**0.27**	**0.60**	**0.39**	0.12	--	**0.42**	**0.15**	**0.30**
Uranium-235	**0.03**	**0.02**	**0.04**	**0.01**	**0.03**	**0.01**	**0.01**	--	**0.02**	**0.01**	**0.01**
Uranium-236	0.04	0.02	0.06	0.01	0.04	0.00	0.001	--	0.00	0.01	0.00
Uranium-238	**0.49**	**0.44**	**0.88**	**0.30**	**0.59**	**0.24**	**0.19**	--	**0.35**	**0.31**	**0.23**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-9. Sample Concentrations for Radiological Contaminants at Exposure Area R.

Well Name	**C7668**			
Sample ID	**B23TK2**	**B23TK5**	**B23TK8**	**B27130**
Top (feet)	**0**	**0**	**5**	**10**
Bottom (feet)	**1**	**1**	**7**	**14**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**			
Americium-241	--	0.51	--	--
Carbon-14	2.48	--	--	2.81
Cesium-137	--	0.33	--	--
Cobalt-60	--	0.33	--	--
Europium-154	--	0.89	--	--
Europium-155	--	0.49	--	--
Iodine-129	--	0.16	--	0.16
Neptunium-237	--	0.16	0.16	0.16
Nickel-63	--	5.23	--	--
Plutonium-238	--	0.29	--	--
Plutonium-239/240	--	0.29	--	--
Plutonium-241	--	1.07	--	--
Selenium-79	--	1.36	--	--
Strontium-90	--	**0.37**	--	--
Technetium-99	--	28.20	28.90	30.10
Tin-126	--	13.60	13.90	14.40
Tritium	3.88	--	--	**2.50**
Uranium-233	--	**2.14**	**2.36**	**1.84**
Uranium-234	**0.22**	--	**0.21**	0.14
Uranium-235	**0.01**	--	**0.01**	**0.01**
Uranium-236	--	0.001	0.001	0.001
Uranium-238	**0.19**	--	**0.22**	**0.16**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

Table F-1-10. Sample Concentrations for Radiological Contaminants at Exposure Area U.

Well Name	**C7676**			
Sample ID	**B26CC4**	**B26JK6**	**B26JK7**	**B29612**
Top (feet)	**10**	**0**	**0**	**5**
Bottom (feet)	**12**	**1**	**1**	**9**
Contaminant of Potential Concern	**Sample Concentration (pCi/g)**			
Americium-241	0.47	0.55	--	0.54
Carbon-14	**1.66**	1.25	--	2.22
Cesium-137	0.59	**2.06**	--	0.55
Cobalt-60	0.37	0.34	--	0.42
Europium-154	1.20	1.05	--	1.18
Europium-155	1.07	--	0.92	1.03
Iodine-129	0.13	--	0.13	0.15
Neptunium-237	0.28	**0.60**	--	0.28
Nickel-63	5.30	--	4.66	5.70
Plutonium-238	0.28	0.28	--	0.30
Plutonium-239/240	0.28	0.28	--	0.30
Plutonium-241	1.04	1.05	--	1.10
Selenium-79	2.94	--	2.25	**2.80**
Strontium-90	0.21	--	**4.20**	0.21
Technetium-99	2.55	--	2.55	2.55
Tin-126	**3.75**	**5.13**	--	**6.32**
Tritium	2.37	1.96	--	1.89
Uranium-233	**0.77**	--	**1.88**	**2.07**
Uranium-234	**0.19**	--	**0.25**	**0.31**
Uranium-235	**0.01**	--	**0.01**	**0.01**
Uranium-236	0.002	--	0.001	0.001
Uranium-238	**0.12**	--	**0.18**	**0.21**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed sample results

ATTACHMENT F-2

RADIOLOGICAL RISK ASSESSMENT RESULTS UNDER CERCLA INDUSTRIAL WORKER SCENARIO

Table F-2-1. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Industrial Worker Scenario.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**6**	**6**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**12**	**12**
COPC	**COPC-Specific ELCR**									
Am-241	—	—	—	6E-09	—	—	—	4E-09	2E-08	—
C-14	—	7E-11	—	1E-10	—	—	4E-11	—	—	—
Cs-137	2E-05	—	—	—	—	—	—	—	2E-04	—
Pu-239/240	—	—	—	—	—	—	—	—	6E-09	—
Pu-241	—	—	—	—	—	—	—	—	2E-09	—
Se-79	—	—	—	—	—	—	—	9E-10	1E-09	—
Sn-126	3E-04	—	2E-04	2E-04	5E-04	1E-04	2E-04	2E-04	3E-04	—
Sr-90	—	1E-06	—	—	—	—	—	—	—	6E-07
U-234	—	2E-09	3E-09	3E-09	3E-09	—	2E-09	2E-09	3E-09	—
U-235	—	1E-08	1E-08	1E-08	1E-08	1E-08	9E-09	1E-08	—	2E-08
U-238	—	5E-08	6E-08	5E-08	5E-08	5E-08	5E-08	6E-08	—	8E-08
$ELCR_{Sample}$	3E-04	1E-06	2E-04	2E-04	5E-04	1E-04	2E-04	2E-04	4E-04	7E-07
$ELCR_{SampleDepth}$	**3E-04**		**2E-04**	**2E-04**	**5E-04**	**1E-04**	**2E-04**	**2E-04**	**4E-04**	

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"—" means either sample results are non-detect or not analyzed

Table F-2-2. Radiological Risk Assessment Results for Exposure Area C under CERCLA Industrial Worker Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR**			
Cs-137	—	4E-05	—	—
Ni-63	—	—	4E-10	—
Sn-126	—	2E-04	5E-04	2E-04
Sr-90	—	1E-07	—	—
U-235	1E-08	—	2E-08	1E-08
U-238	6E-08	—	9E-08	6E-08
$ELCR_{Sample}$	7E-08	3E-04	5E-04	2E-04
$ELCR_{SampleDepth}$	**3E-04**		**5E-04**	**2E-04**

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-2-3. Radiological Risk Assessment Results for Exposure Area E under CERCLA Industrial Worker Scenario.

Well Name	**C7672**				
Sample ID	**B26C68**	**B26C70**	**B26C74**	**B26JK2**	**B26JK3**
Top (feet)	**5**	**10**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR**				
Cs-137	—	—	—	3E-05	—
Se-79	7E-10	2E-09	7E-10	9E-10	—
Sn-126	6E-05	4E-05	4E-05	2E-04	—
Sr-90	—	—	—	1E-07	—
U-233	3E-08	3E-08	3E-08	—	3E-08
U-234	2E-09	—	5E-09	—	3E-09
U-235	1E-08	1E-08	2E-08	—	2E-08
U-238	7E-08	6E-08	9E-08	—	8E-08
$ELCR_{Sample}$	6E-05	4E-05	4E-05	2E-04	1E-07
$ELCR_{SampleDepth}$	**6E-05**	**4E-05**	**4E-05**	**2E-04**	

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-2-4. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Industrial Worker Scenario.

Well Name	**C7468**				**C7472**				
Sample ID	**B211Y3**	**B211Y6**	**B211Y9**	**B215L0**	**B236N5**	**B236N8**	**B236P2**	**B238H1**	**B23KT4**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**0**	**5**	**14**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**1**	**7**	**16**	**14**
COPC	**COPC-Specific ELCR**								
C-14	—	—	—	—	1E-10	—	—	2E-10	4E-10
Cs-137	—	—	—	3E-05	—	1E-05	—	—	—
Se-79	—	—	—	—	—	—	1E-09	—	—
Sn-126	—	—	—	—	3E-05	—	—	—	—
Sr-90	—	—	—	—	1E-08	—	—	1E-08	—
U-233	2E-08	1E-08	1E-08	4E-08	2E-08	—	2E-08	2E-08	1E-08
U-234	—	2E-09	2E-09	3E-09	—	3E-09	4E-09	—	—
U-235	1E-08	9E-09	1E-08	2E-08	1E-08	—	2E-08	1E-08	1E-08
U-238	5E-08	4E-08	5E-08	9E-08	6E-08	—	1E-07	5E-08	5E-08
$ELCR_{Sample}$	8E-08	7E-08	7E-08	3E-05	3E-05	1E-05	2E-07	1E-07	7E-08
$ELCR_{SampleDepth}$	8E-08	7E-08	7E-08	3E-05	**4E-05**		2E-07	1E-07	7E-08

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Table F-2-5. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Industrial Worker Scenario.

Well Name	**C7680**					**C7682**				
Sample ID	**B26C26**	**B26C28**	**B26C30**	**B26JK8**	**B26JK9**	**B26C47**	**B26C51**	**B26C53**	**B26JL0**	**B26JL1**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**12**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**14**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR**									
C-14	—	—	—	—	—	1E-10	—	—	—	—
H-3	—	—	—	1E-07	—	—	4E-09	7E-09	—	4E-09
Se-79	9E-10	1E-09	—	—	—	—	—	—	—	—
Sn-126	7E-05	—	4E-05	—	7E-05	8E-05	3E-05	5E-05	—	1E-04
U-233	2E-08	1E-08	2E-08	2E-08	—	3E-08	2E-08	2E-08	3E-08	—
U-234	3E-09	3E-09	—	4E-09	—	—	—	—	—	—
U-235	1E-08	1E-08	1E-08	1E-08	—	1E-08	1E-08	1E-08	—	1E-08
U-238	6E-08	5E-08	6E-08	5E-08	—	5E-08	6E-08	6E-08	—	6E-08
$ELCR_{Sample}$	7E-05	8E-08	4E-05	2E-07	7E-05	8E-05	3E-05	5E-05	3E-08	1E-04
$ELCR_{Sample}$ $_{Depth}$	7E-05	8E-08	4E-05	7E-05		8E-05	3E-05	5E-05	1E-04	

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Table F-2-6. Radiological Risk Assessment Results for Exposure Area J under CERCLA Industrial Worker Scenario.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR**			
C-14	—	4E-10	—	—
Cs-137	—	3E-05	—	—
Pu-238	—	1E-09	—	—
Pu-239/240	7E-10	—	—	—
Pu-241	2E-10	—	—	—
Se-79	—	5E-09	2E-09	2E-09
Sr-90	—	2E-07	—	—
U-235	2E-08	—	1E-08	1E-08
U-238	7E-08	—	6E-08	6E-08
$ELCR_{Sample}$	9E-08	3E-05	8E-08	8E-08
$ELCR_{Sample}$Depth	3E-05		8E-08	8E-08

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Table F-2-7. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Industrial Worker Scenario.

Well Name	**C7466**					**C7670**				
Sample ID	**B20XW6**	**B20XW9**	**B20XX2**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23R25**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**0**	**0**	**10**	**14**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**1**	**1**	**14**	**16**
COPC	**COPC-Specific ELCR**									
C-14	2E-09	—	—	1E-09	—	—	—	—	—	1E-10
Cs-137	2E-06	—	—	—	1E-05	—	—	4E-05	—	—
H-3	—	—	—	—	—	6E-09	—	—	—	—
Ni-63	—	—	—	—	—	—	3E-08	—	—	—
Se-79	—	7E-10	—	—	—	—	—	—	—	—
Sn-126	—	—	—	—	—	—	3E-05	—	—	9E-05
Sr-90	—	—	—	—	2E-07	6E-09	7E-08	—	—	—
U-233	2E-08	7E-09	1E-08	—	2E-08	2E-08	4E-08	—	3E-08	2E-08
U-234	2E-09	—	3E-09	3E-09	—	—	3E-09	—	—	2E-09
U-235	2E-08	7E-09	9E-09	—	1E-08	1E-08	2E-08	—	9E-09	1E-08
U-238	8E-08	4E-08	5E-08	—	6E-08	5E-08	1E-07	—	4E-08	5E-08
$ELCR_{Sample}$	3E-06	5E-08	7E-08	4E-09	1E-05	9E-08	3E-05	4E-05	8E-08	9E-05
$ELCR_{Sample}$ $_{Depth}$	3E-06	5E-08	7E-08	1E-05		9E-08	8E-05		8E-08	9E-05

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Table F-2-8. Radiological Risk Assessment Results for Exposure Area P under CERCLA Industrial Worker Scenario.

Well Name	**C6392**	**C6400**		**C6402**			**C6404**		**C6406**		
Sample ID	**B1YT71**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW3**	**B1YT92**	**B1YT93**	**B1YTC9**	**B1YTD2**	**B1YTD5**
Top (feet)	**14**	**5**	**10**	**6**	**10**	**14**	**6**	**10**	**5**	**10**	**14**
Bottom (feet)	**16**	**7**	**12**	**8**	**12**	**16**	**8**	**12**	**7**	**12**	**16**
COPC	**COPC-Specific ELCR**										
Am-241	2E-07	—	—	—	—	—	—	—	—	—	—
Co-60	9E-06	—	—	—	—	—	—	—	—	—	—
Cs-137	4E-04	5E-06	2E-06	2E-04	1E-04	8E-05	2E-04	—	—	—	—
H-3	—	—	4E-07	—	—	—	—	—	—	—	—
I-129	—	4E-08	—	—	—	—	—	—	—	—	—
Ni-63	—	—	8E-09	—	—	—	—	—	—	—	—
Np-237	3E-06	—	—	—	—	—	—	—	—	—	—
Pu-239/240	2E-07	—	—	—	—	—	—	—	—	—	—
Pu-241	6E-08	—	—	—	—	—	—	—	—	—	—
Se-79	1E-09	1E-09	2E-09	4E-09	8E-10	2E-09	—	—	—	—	8E-10
Sr-90	6E-06	1E-07	—	4E-06	3E-06	4E-06	3E-06	7E-06	6E-07	—	—
Tc-99	6E-09	—	—	—	—	—	—	—	—	—	—
U-233	2E-08	1E-08	3E-08	3E-08	3E-08	4E-08	2E-08	—	2E-08	4E-08	2E-08
U-234	7E-09	6E-09	1E-08	3E-09	6E-09	4E-09	—	—	4E-09	2E-09	3E-09
U-235	4E-08	3E-08	7E-08	2E-08	4E-08	2E-08	1E-08	—	2E-08	2E-08	2E-08
U-238	2E-07	1E-07	3E-07	1E-07	2E-07	8E-08	6E-08	—	1E-07	1E-07	8E-08
$ELCR_{Sample}$	4E-04	6E-06	3E-06	2E-04	1E-04	9E-05	2E-04	7E-06	8E-07	2E-07	1E-07
$ELCR_{SampleDepth}$	**4E-04**	6E-06	3E-06	**2E-04**	**1E-04**	**9E-05**	**2E-04**	**7E-06**	**8E-07**	2E-07	1E-07

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Table F-2-9. Radiological Risk Assessment Results for Exposure Area R under CERCLA Industrial Worker Scenario.

Well Name	**C7668**			
Sample ID	**B23TK2**	**B23TK5**	**B23TK8**	**B27130**
Top (feet)	**0**	**0**	**5**	**10**
Bottom (feet)	**1**	**1**	**7**	**14**
COPC	**COPC-Specific ELCR**			
H-3	—	—	—	3E-09
Sr-90	—	2E-08	—	—
U-233	—	4E-08	4E-08	3E-08
U-234	2E-09	—	2E-09	—
U-235	1E-08	—	2E-08	1E-08
U-238	6E-08	—	7E-08	5E-08
$ELCR_{Sample}$	8E-08	5E-08	1E-07	1E-07
$ELCR_{SampleDepth}$	1E-07		1E-07	1E-07

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"—" means either sample results are non-detect or not analyzed

Table F-2-10. Radiological Risk Assessment Results for Exposure Area U under CERCLA Industrial Worker Scenario.

Well Name	**C7676**			
Sample ID	**B26CC4**	**B26JK6**	**B26JK7**	**B29612**
Top (feet)	**10**	**0**	**0**	**5**
Bottom (feet)	**12**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR**			
C-14	5E-11	—	—	—
Cs-137	—	1E-05	—	—
Np-237	—	1E-06	—	—
Se-79	—	—	—	1E-09
Sn-126	4E-05	5E-05	—	6E-05
Sr-90	—	—	2E-07	—
U-233	1E-08	—	3E-08	3E-08
U-234	2E-09	—	3E-09	3E-09
U-235	9E-09	—	1E-08	1E-08
U-238	4E-08	—	6E-08	7E-08
$ELCR_{Sample}$	4E-05	6E-05	3E-07	6E-05
$ELCR_{SampleDepth}$	4E-05	6E-05		6E-05

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

ATTACHMENT F-3

RADIOLOGICAL RISK ASSESSMENT RESULTS UNDER CERCLA RESIDENTIAL RECEPTOR SCENARIO

Table F-3-1. Radiological Risk Assessment Results for Exposure Area A + B under CERCLA Residential Receptor Scenario.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**6**	**6**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**12**	**12**
COPC	**COPC-Specific ELCR**									
Am-241	—	—	—	3E-08	—	—	—	2E-08	7E-08	—
C-14	—	5E-07	—	7E-07	—	—	3E-07	—	—	—
Cs-137	7E-05	—	—	—	—	—	—	—	4E-04	—
Pu-239/240	—	—	—	—	—	—	—	—	8E-08	—
Pu-241	—	—	—	—	—	—	—	—	9E-09	—
Se-79	—	—	—	—	—	—	—	4E-06	5E-06	—
Sn-126	9E-04	—	8E-04	6E-04	2E-03	5E-04	6E-04	9E-04	1E-03	—
Sr-90	—	4E-04	—	—	—	—	—	—	—	2E-04
U-234	—	4E-08	6E-08	6E-08	6E-08	—	4E-08	5E-08	8E-08	—
U-235	—	3E-08	4E-08	3E-08	3E-08	3E-08	3E-08	4E-08	—	5E-08
U-238	—	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	2E-07	—	3E-07
$ELCR_{Sample}$	1E-03	4E-04	8E-04	6E-04	2E-03	5E-04	6E-04	9E-04	1E-03	2E-04
$ELCR_{SampleDepth}$	**1E-03**		**8E-04**	**6E-04**	**2E-03**	**5E-04**	**6E-04**	**9E-04**	**2E-03**	

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"—" means either sample results are non-detect or not analyzed

Table F-3-2. Radiological Risk Assessment Results for Exposure Area C under CERCLA Residential Receptor Scenario.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR**			
Cs-137	—	1E-04	—	—
Ni-63	—	—	1E-07	—
Sn-126	—	9E-04	2E-03	7E-04
Sr-90	—	4E-05	—	—
U-235	4E-08	—	6E-08	4E-08
U-238	2E-07	—	3E-07	2E-07
$ELCR_{Sample}$	3E-07	1E-03	2E-03	7E-04
$ELCR_{SampleDepth}$	**1E-03**		**2E-03**	**7E-04**

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-3. Radiological Risk Assessment Results for Exposure Area E under CERCLA Residential Receptor Scenario.

Well Name	**C7672**				
Sample ID	**B26C68**	**B26C70**	**B26C74**	**B26JK2**	**B26JK3**
Top (feet)	**5**	**10**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR**				
Cs-137	—	—	—	8E-05	—
Se-79	3E-06	7E-06	3E-06	4E-06	—
Sn-126	2E-04	1E-04	1E-04	6E-04	—
Sr-90	—	—	—	4E-05	—
U-233	5E-07	5E-07	4E-07	—	5E-07
U-234	5E-08	—	1E-07	—	6E-08
U-235	4E-08	4E-08	5E-08	—	5E-08
U-238	2E-07	2E-07	3E-07	—	3E-07
$ELCR_{Sample}$	2E-04	1E-04	1E-04	8E-04	9E-07
$ELCR_{SampleDepth}$	**2E-04**	**1E-04**	**1E-04**	**8E-04**	

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-4. Radiological Risk Assessment Results for Exposure Area F + G under CERCLA Residential Receptor Scenario.

Well Name	**C7468**				**C7472**				
Sample ID	**B211Y3**	**B211Y6**	**B211Y9**	**B215L0**	**B236N5**	**B236N8**	**B236P2**	**B238H1**	**B23KT4**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**0**	**5**	**14**	**10**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**1**	**7**	**16**	**14**
COPC	**COPC-Specific ELCR**								
C-14	—	—	—	—	7E-07	—	—	1E-06	3E-06
Cs-137	—	—	—	8E-05	—	3E-05	—	—	—
Se-79	—	—	—	—	—	—	4E-06	—	—
Sn-126	—	—	—	—	9E-05	—	—	—	—
Sr-90	—	—	—	—	4E-06	—	—	4E-06	—
U-233	3E-07	2E-07	2E-07	6E-07	3E-07	—	4E-07	2E-07	2E-07
U-234	—	4E-08	4E-08	6E-08	—	7E-08	1E-07	—	—
U-235	3E-08	3E-08	3E-08	5E-08	3E-08	—	7E-08	3E-08	3E-08
U-238	2E-07	2E-07	2E-07	3E-07	2E-07	—	4E-07	2E-07	2E-07
$ELCR_{Sample}$	5E-07	4E-07	4E-07	8E-05	9E-05	3E-05	5E-06	6E-06	3E-06
$ELCR_{SampleDepth}$	5E-07	4E-07	4E-07	8E-05	**1E-04**		5E-06	6E-06	3E-06

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-5. Radiological Risk Assessment Results for Exposure Area H + I under CERCLA Residential Receptor Scenario.

Well Name	**C7680**					**C7682**				
Sample ID	**B26C26**	**B26C28**	**B26C30**	**B26JK8**	**B26JK9**	**B26C47**	**B26C51**	**B26C53**	**B26JL0**	**B26JL1**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**12**	**14**	**0**	**0**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**14**	**16**	**1**	**1**
COPC	**COPC-Specific ELCR**									
C-14	—	—	—	—	—	7E-07	—	—	—	—
H-3	—	—	—	3E-06	—	—	1E-07	2E-07	—	1E-07
Se-79	4E-06	5E-06	—	—	—	—	—	—	—	—
Sn-126	2E-04	—	1E-04	—	2E-04	3E-04	1E-04	2E-04	—	3E-04
U-233	4E-07	2E-07	4E-07	4E-07	—	5E-07	3E-07	3E-07	5E-07	—
U-234	6E-08	7E-08	—	8E-08	—	—	—	—	—	—
U-235	4E-08	3E-08	3E-08	3E-08	—	3E-08	3E-08	4E-08	—	4E-08
U-238	2E-07	2E-07	2E-07	2E-07	—	2E-07	2E-07	2E-07	—	2E-07
$ELCR_{Sample}$	2E-04	5E-06	1E-04	3E-06	2E-04	3E-04	1E-04	2E-04	5E-07	3E-04
$ELCR_{Sample}$ $_{Depth}$	**2E-04**	5E-06	**1E-04**	**3E-04**		**3E-04**	**1E-04**	**2E-04**	**3E-04**	

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-6. Radiological Risk Assessment Results for Exposure Area J under CERCLA Residential Receptor Scenario.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR**			
C-14	—	3E-06	—	—
Cs-137	—	9E-05	—	—
Pu-238	—	2E-08	—	—
Pu-239/240	1E-08	—	—	—
Pu-241	1E-09	—	—	—
Se-79	—	2E-05	7E-06	9E-06
Sr-90	—	6E-05	—	—
U-235	4E-08	—	4E-08	4E-08
U-238	3E-07	—	2E-07	2E-07
$ELCR_{Sample}$	3E-07	2E-04	7E-06	9E-06
$ELCR_{Sample}$Depth	**2E-04**		7E-06	9E-06

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-7. Radiological Risk Assessment Results for Exposure Area L1 + L2 under CERCLA Residential Receptor Scenario.

Well Name	**C7466**					**C7670**				
Sample ID	**B20XW6**	**B20XW9**	**B20XX2**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23R25**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**10**	**14**	**0**	**0**	**5**	**0**	**0**	**10**	**14**
Bottom (feet)	**7**	**12**	**16**	**1**	**1**	**7**	**1**	**1**	**14**	**16**
COPC	**COPC-Specific ELCR**									
C-14	1E-05	—	—	9E-06	—	—	—	—	—	1E-06
Cs-137	7E-06	—	—	—	4E-05	—	—	1E-04	—	—
H-3	—	—	—	—	—	2E-07	—	—	—	—
Ni-63	—	—	—	—	—	—	1E-05	—	—	—
Se-79	—	3E-06	—	—	—	—	—	—	—	—
Sn-126	—	—	—	—	—	—	1E-04	—	—	3E-04
Sr-90	—	—	—	—	6E-05	2E-06	2E-05	—	—	—
U-233	3E-07	1E-07	2E-07	—	3E-07	3E-07	5E-07	—	4E-07	2E-07
U-234	3E-08	—	6E-08	7E-08	—	—	6E-08	—	—	4E-08
U-235	5E-08	2E-08	3E-08	—	4E-08	3E-08	7E-08	—	3E-08	3E-08
U-238	3E-07	1E-07	2E-07	—	2E-07	2E-07	4E-07	—	2E-07	2E-07
$ELCR_{Sample}$	2E-05	3E-06	4E-07	9E-06	1E-04	2E-06	2E-04	1E-04	6E-07	3E-04
$ELCR_{SampleDepth}$	2E-05	3E-06	4E-07	**1E-04**		2E-06	**3E-04**		6E-07	**3E-04**

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-8. Radiological Risk Assessment Results for Exposure Area P under CERCLA Residential Receptor Scenario.

Well Name	**C6392**	**C6400**		**C6402**			**C6404**		**C6406**		
Sample ID	**B1YT71**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW3**	**B1YT92**	**B1YT93**	**B1YTC9**	**B1YTD2**	**B1YTD5**
Top (feet)	**14**	**5**	**10**	**6**	**10**	**14**	**6**	**10**	**5**	**10**	**14**
Bottom (feet)	**16**	**7**	**12**	**8**	**12**	**16**	**8**	**12**	**7**	**12**	**16**
COPC	**COPC-Specific ELCR**										
Am-241	9E-07	—	—	—	—	—	—	—	—	—	—
Co-60	2E-05	—	—	—	—	—	—	—	—	—	—
Cs-137	1E-03	2E-05	5E-06	5E-04	3E-04	2E-04	6E-04	—	—	—	—
H-3	—	—	1E-05	—	—	—	—	—	—	—	—
I-129	—	3E-06	—	—	—	—	—	—	—	—	—
Ni-63	—	—	3E-06	—	—	—	—	—	—	—	—
Np-237	1E-05	—	—	—	—	—	—	—	—	—	—
Pu-239/240	3E-06	—	—	—	—	—	—	—	—	—	—
Pu-241	3E-07	—	—	—	—	—	—	—	—	—	—
Se-79	4E-06	5E-06	8E-06	2E-05	4E-06	9E-06	—	—	—	—	4E-06
Sr-90	2E-03	3E-05	—	1E-03	1E-03	1E-03	8E-04	2E-03	2E-04	—	—
Tc-99	2E-04	—	—	—	—	—	—	—	—	—	—
U-233	3E-07	2E-07	4E-07	4E-07	5E-07	7E-07	3E-07	—	3E-07	6E-07	3E-07
U-234	2E-07	1E-07	3E-07	7E-08	1E-07	9E-08	—	—	1E-07	4E-08	7E-08
U-235	1E-07	9E-08	2E-07	6E-08	1E-07	5E-08	4E-08	—	7E-08	6E-08	4E-08
U-238	6E-07	5E-07	1E-06	4E-07	7E-07	3E-07	2E-07	—	4E-07	4E-07	3E-07
$ELCR_{Sample}$	3E-03	6E-05	3E-05	2E-03	1E-03	1E-03	1E-03	2E-03	2E-04	1E-06	4E-06
$ELCR_{SampleDepth}$	**3E-03**	6E-05	3E-05	**2E-03**	**1E-03**	**1E-03**	**1E-03**	**2E-03**	**2E-04**	1E-06	4E-06

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COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-9. Radiological Risk Assessment Results for Exposure Area R under CERCLA Residential Receptor Scenario.

Well Name	**C7668**			
Sample ID	**B23TK2**	**B23TK5**	**B23TK8**	**B27130**
Top (feet)	**0**	**0**	**5**	**10**
Bottom (feet)	**1**	**1**	**7**	**14**
COPC	**COPC-Specific ELCR**			
H-3	—	—	—	9E-08
Sr-90	—	5E-06	—	—
U-233	—	6E-07	6E-07	5E-07
U-234	5E-08	—	5E-08	—
U-235	4E-08	—	5E-08	3E-08
U-238	2E-07	—	3E-07	2E-07
$ELCR_{Sample}$	3E-07	6E-06	1E-06	8E-07
$ELCR_{SampleDepth}$	6E-06		1E-06	8E-07

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

Table F-3-10. Radiological Risk Assessment Results for Exposure Area U under CERCLA Residential Receptor Scenario.

Well Name	**C7676**			
Sample ID	**B26CC4**	**B26JK6**	**B26JK7**	**B29612**
Top (feet)	**10**	**0**	**0**	**5**
Bottom (feet)	**12**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR**			
C-14	3E-07	—	—	—
Cs-137	—	3E-05	—	—
Np-237	—	5E-06	—	—
Se-79	—	—	—	5E-06
Sn-126	1E-04	2E-04	—	2E-04
Sr-90	—	—	6E-05	—
U-233	2E-07	—	5E-07	5E-07
U-234	5E-08	—	6E-08	8E-08
U-235	3E-08	—	3E-08	4E-08
U-238	1E-07	—	2E-07	2E-07
$ELCR_{Sample}$	1E-04	2E-04	6E-05	2E-04
$ELCR_{SampleDepth}$	**1E-04**	**3E-04**		**2E-04**

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC = contaminant of potential concern ELCR = excess lifetime cancer risk
"—" means either sample results are non-detect or not analyzed

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APPENDIX G

DIRECT CONTRACT NONRADIOLOGICAL RISK AND HAZARD EVALUATIONS USING SAMPLE BY SAMPLE APPROACH

Table of Contents

Attachment G-1: Sample Results for Nonradiological Contaminants G-1

Table G-1-1. Sample Concentrations for Nonradiological Contaminants at Exposure Area A + B. G-3

Table G-1-2. Sample Concentrations for Nonradiological Contaminants at Exposure Area C. G-5

Table G-1-3. Sample Concentrations for Nonradiological Contaminants at Exposure Area E. G-7

Table G-1-4. Sample Concentrations for Nonradiological Contaminants at Exposure Area F + G. G-9

Table G-1-5. Sample Concentrations for Nonradiological Contaminants at Exposure Area H + I. G-11

Table G-1-6. Sample Concentrations for Nonradiological Contaminants at Exposure Area J. G-13

Table G-1-7. Sample Concentrations for Nonradiological Contaminants at Exposure Area L1 + L2. ..... G-15

Table G-1-8. Sample Concentrations for Nonradiological Contaminants at Exposure Area P. G-17

Table G-1-9. Sample Concentrations for Nonradiological Contaminants at Exposure Area R. G-19

Table G-1-10. Sample Concentrations for Nonradiological Contaminants at Exposure Area U. G-21

Attachment G-2: Nonradiological Risk Evaluation Results for Washington Administrative Code Industrial Worker G-23

Table G-2-1. Carcinogenic Risk Assessment Results for Exposure Area A + B. G-24

Table G-2-2. Carcinogenic Risk Assessment Results for Exposure Area C. G-26

Table G-2-3. Carcinogenic Risk Assessment Results for Exposure Area E. G-27

Table G-2-4. Carcinogenic Risk Assessment Results for Exposure Area F + G. G-29

Table G-2-5. Carcinogenic Risk Assessment Results for Exposure Area H + I. G-31

Table G-2-6. Carcinogenic Risk Assessment Results for Exposure Area J. G-33

Table G-2-7. Carcinogenic Risk Assessment Results for Exposure Area L1 + L2..... G-35

Table G-2-8. Carcinogenic Risk Assessment Results for Exposure Area P..... G-37

Table G-2-9. Carcinogenic Risk Assessment Results for Exposure Area R. G-39

Table G-2-10. Carcinogenic Risk Assessment Results for Exposure Area U. G-41

Attachment G-3: Nonradiological Risk Evaluation Results for Washington Administrative Code Residential Receptor..... G-42

Table G-3-1. Carcinogenic Risk Assessment Results for Exposure Area A + B. G-43

Table G-3-2. Carcinogenic Risk Assessment Results for Exposure Area C. G-44

Table G-3-3. Carcinogenic Risk Assessment Results for Exposure Area E..... G-46

Table G-3-4. Carcinogenic Risk Assessment Results for Exposure Area F + G..... G-47

Table G-3-5. Carcinogenic Risk Assessment Results for Exposure Area H + I..... G-49

Table G-3-6. Carcinogenic Risk Assessment Results for Exposure Area J. G-51

Table G-3-7. Carcinogenic Risk Assessment Results for Exposure Area L1 + L2..... G-53

Table G-3-8. Carcinogenic Risk Assessment Results for Exposure Area P..... G-55

Table G-3-9. Carcinogenic Risk Assessment Results for Exposure Area R. G-57

Table G-3-10. Carcinogenic Risk Assessment Results for Exposure Area U. G-59

Attachment G-4: Nonradiological Hazard Evaluation Results for Washington Administrative Code Industrial Worker G-60

Table G-4-1. Non-Cancer Hazard Results for Exposure Area A + B..... G-61

Table G-4-2. Non-Cancer Hazard Results for Exposure Area C..... G-62

Table G-4-3. Non-Cancer Hazard Results for Exposure Area E..... G-63

Table G-4-4. Non-Cancer Hazard Results for Exposure Area F + G..... G-65

Table G-4-5. Non-Cancer Hazard Results for Exposure Area H + I..... G-67

Table G-4-6. Non-Cancer Hazard Results for Exposure Area J. G-69

Table G-4-7. Non-Cancer Hazard Results for Exposure Area L1 + L2. ..... G-71

Table G-4-8. Non-Cancer Hazard Results for Exposure Area P. G-73

Table G-4-9. Non-Cancer Hazard Results for Exposure Area R. G-75

Table G-4-10. Non-Cancer Hazard Results for Exposure Area U. G-77

Attachment G-5: Nonradiological Hazard Evaluation Results for Washington Administrative Code Residential Receptor G-78

Table G-5-1. Non-Cancer Hazard Results for Exposure Area A + B. G-79

Table G-5-2. Non-Cancer Hazard Results for Exposure Area C. G-80

Table G-5-3. Non-Cancer Hazard Results for Exposure Area E. G-81

Table G-5-4. Non-Cancer Hazard Results for Exposure Area F + G. G-83

Table G-5-5. Non-Cancer Hazard Results for Exposure Area H + I. G-85

Table G-5-6. Non-Cancer Hazard Results for Exposure Area J. G-87

Table G-5-7. Non-Cancer Hazard Results for Exposure Area L1 + L2. ..... G-89

Table G-5-8. Non-Cancer Hazard Results for Exposure Area P. G-91

Table G-5-9. Non-Cancer Hazard Results for Exposure Area R. G-93

Table G-5-10. Non-Cancer Hazard Results for Exposure Area U. G-95

ATTACHMENT G-1

SAMPLE RESULTS FOR NONRADIOLOGICAL CONTAMINANTS

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Table G-1-1. Sample Concentrations for Nonradiological Contaminants at Exposure Area A + B.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**									
Aluminum	--	**7,360,000**	**7,480,000**	**6,710,000**	**6,980,000**	**7,100,000**	**6,910,000**	**7,860,000**	**7,770,000**	--
Antimony	--	**211**	**231**	**252**	**269**	**123**	**114**	**168**	**342**	--
Aroclor-1254	--	**6.46**	5.38	5.7	--	5.98	5.94	5.95	**8.59**	--
Aroclor-1260	--	9.73	8.69	9.21	--	9.67	9.6	9.61	--	9.61
Arsenic	--	**2,400**	**3,320**	**2,880**	**3,170**	**2,430**	**2,780**	**2,590**	**5,220**	--
Barium	--	**100,000**	**78,800**	**66,100**	**80,300**	**70,200**	**72,900**	**75,800**	**81,100**	--
Beryllium	--	228	222	233	221	227	222	225	217	--
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	--	0.31	0.48	0.46	--	0.62	0.61	0.62	--	0.31
Bis(2-ethylhexyl) phthalate	--	592	592	572	--	200	200	200	--	200
Butylbenzylphthalate	--	50.2	50.2	48.5	--	300	200	200	--	200
Cadmium	--	**117**	**105**	**82.4**	**96.6**	**39.3**	**44**	**42**	--	**83.4**
Chromium	--	**7,840**	**7,440**	**8,440**	**5,970**	**7,830**	**10,100**	**11,100**	**8,990**	--
Cobalt	--	**8,380**	**6,540**	**6,470**	**9,200**	**6,910**	**7,100**	**6,650**	**11,400**	--
Copper	**11,500**	--	**11,100**	**10,800**	**12,800**	**12,500**	**11,400**	**11,800**	**14,200**	--
Fluoride	--	**717**	**2,750**	**943**	**2,050**	1,900	1,800	1,800	--	310
Gamma-BHC (Lindane)	--	0.18	0.27	0.26	--	0.35	0.34	0.35	--	0.17
Iron	--	**23,000,000**	**21,200,000**	**22,500,000**	**26,200,000**	**22,800,000**	**21,300,000**	**23,600,000**	**23,600,000**	--
Lead	--	**7,210**	**5,810**	**4,650**	**4,970**	**3,340**	**3,200**	**2,920**	**5,640**	--
Lithium	--	**7,820**	**8,540**	**7,640**	**7,100**	**7,760**	**8,250**	**8,640**	--	**8,170**
Manganese	--	**324,000**	**331,000**	**319,000**	**377,000**	**321,000**	**299,000**	**346,000**	**371,000**	--
Mercury	--	9.31	9.1	9.09	9.09	12	12	12	11	--
Molybdenum	--	4,560	4,450	4670	4,410	4,530	4,430	4,500	4,330	--
Nickel	**10,300**	--	**7,530**	**12,200**	**8,280**	**9,520**	**8,220**	**11,800**	**9,840**	--
Nitrate	--	**3,900**	**16,100**	**4,640**	**8,830**	4,380	4,340	**5,270**	**1,710**	--
Nitrite	--	**1,080**	**848**	**342**	**361**	3,280	3,280	3,280	--	558
Selenium	--	278	271	285	269	612	598	608	585	--
Silver	--	**52.5**	**45.1**	**46.4**	**52.5**	**31.5**	**28.6**	**29.2**	**46.1**	--
Strontium	--	**45,000**	**34,400**	**31,400**	**30,100**	**32,200**	**30,100**	**35,000**	**37,200**	--
Vanadium	--	**58,200**	**48,300**	**55,700**	**66,500**	**55,000**	**51,800**	**58,900**	--	**56,700**
Zinc	--	**44,500**	**41,200**	**41,400**	**47,500**	**42,100**	**41,600**	**46,900**	**45,600**	--

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-2. Sample Concentrations for Nonradiological Contaminants at Exposure Area C. (2 sheets)

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**			
Aldrin	--	0.32	0.37	0.35
Aluminum	**8,270,000**	--	**9,440,000**	**9,510,000**
Antimony	--	**283**	**721**	**175**
Aroclor-1254	--	6.78	5.21	4.89
Aroclor-1260	--	11	8.41	7.9
Arsenic	--	**6,700**	**21,200**	**3,810**
Barium	**81,500**	--	**85,300**	**98,800**
Beryllium	**323**	--	**403**	**355**
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	--	0.32	0.36	0.35
Bis(2-ethylhexyl) phthalate	587	--	570	589
Butylbenzylphthalate	--	**80.7**	48.3	49.9
Cadmium	--	**109**	**150**	**94.9**
Chromium	**9,290**	--	**10,600**	**12,800**
Cobalt	**9,010**	--	**9,600**	**11,000**
Copper	--	**13,200**	**18,100**	**15,100**
Fluoride	**557**	--	**2,040**	**2,290**
Gamma-BHC (Lindane)	--	0.18	0.2	0.19

Table G-1-2. Sample Concentrations for Nonradiological Contaminants at Exposure Area C. (2 sheets)

Well Name	C8106			
Sample ID	B2FPR7	B2FPR8	B2FYM3	B2FYM4
Contaminant of Potential Concern (continued)	Sample Concentration (µg/kg) (continued)			
Iron	**22,800,000**	--	**23,700,000**	**28,600,000**
Lead	--	**6,090**	**10,600**	**3,710**
Lithium	--	**8,740**	**12,100**	**7,800**
Manganese	**373,000**	--	**408,000**	**449,000**
Mercury	--	**5.06**	0.982	**3.9**
Molybdenum	2,780	--	2,750	2,700
Nickel	**13,000**	--	**10,800**	**11,900**
Nitrate	--	**4,210**	**17,400**	**10,600**
Nitrite	**2,050**	--	**2,110**	**1,180**
Selenium	626	--	619	608
Silver	**45.9**	--	**80**	**40**
Strontium	--	**33,100**	**44,700**	**36,700**
Vanadium	--	**49,000**	**52,400**	**78,500**
Zinc	**44,600**	--	**51,100**	**44,800**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-3. Sample Concentrations for Nonradiological Contaminants at Exposure Area E.

Well Name	C7672									
Sample ID	B26C68	B26C69	B26C70	B26C71	B26C74	B26C75	B26JK2	B26JK3	B26JL2	B26JL3
Top (feet)	5	5	10	10	14	14	0	0	0	0
Bottom (feet)	7	7	12	12	16	16	1	1	1	1
Contaminant of Potential Concern	Sample Concentration (µg/kg)									
1-Butanol	--	10.1	--	10.6	--	10.3	--	--	--	7.98
2-Butanone	--	1.92	--	2.03	--	1.96	--	--	--	1.52
Acetone	--	**4.14**	--	**6.63**	--	**4.83**	--	--	--	1.71
Aldrin	0.31	--	**2**	--	0.32	--	--	0.32	--	--
Aluminum	**7,170,000**	--	**7,420,000**	--	**6,810,000**	--	--	**7,080,000**	--	--
Antimony	**157**	--	**92.6**	--	**164**	--	**178**	--	--	--
Aroclor-1254	6.1	--	6.2	--	6.4	--	--	6.4	--	--
Aroclor-1260	6.1	--	6.2	--	6.4	--	--	6.4	--	--
Arsenic	**5,070**	--	**3,390**	--	**2,990**	--	--	**5,200**	--	--
Barium	**75,000**	--	**76,400**	--	**78,400**	--	--	**76,600**	--	--
Benzene	--	0.14	--	0.15	--	0.15	--	--	--	0.11
Beryllium	**159**	--	**158**	--	**147**	--	**158**	--	--	--
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	0.3	--	0.3	--	0.31	--	0.31	--	--	--
Bis(2-ethylhexyl) phthalate	583	--	584	--	575	--	--	588	--	--
Butylbenzylphthalate	**123**	--	118	--	**121**	--	**124**	--	--	--
Cadmium	**2,700**	--	**2,870**	--	**3,180**	--	--	**3,260**	--	--
Carbon disulfide	--	0.16	--	0.17	--	0.16	--	--	--	0.13
Chromium	**10,400**	--	**17,200**	--	**11,900**	--	--	**7,980**	--	--
Cobalt	**8,120**	--	**7,990**	--	**7,620**	--	--	**8,820**	--	--
Copper	**12,700**	--	**16,500**	--	**12,000**	--	--	**12,900**	--	--
Fluoride	**1,410**	--	**1,480**	--	**1,230**	--	--	**995**	--	--
Gamma-BHC (Lindane)	0.17	--	0.17	--	0.17	--	0.17	--	--	--
Iron	**22,400,000**	--	**22,100,000**	--	**21,600,000**	--	--	**24,200,000**	--	--
Lead	4,980	--	4,980	--	4,970	--	4,910	--	--	--
Lithium	**7,420**	--	**7,730**	--	**7,030**	--	**9,130**	--	--	--
Manganese	**332,000**	--	**331,000**	--	**298,000**	--	**495,000**	--	--	--
Mercury	9.78	--	9.9	--	9.18	--	--	**23.2**	--	--
Methylene chloride	--	0.06	--	0.07	--	0.06	--	--	--	0.05
Molybdenum	1,990	--	1,990	--	1,990	--	1,960	--	--	--
Nickel	**7,820**	--	**12,400**	--	**11,100**	--	**9,550**	--	--	--
Nitrate	**4,060**	--	**2,850**	--	**3,720**	--	--	**5,020**	--	--
Nitrite	**1,030**	--	**1,400**	--	**724**	--	--	**1,060**	--	--
Selenium	**343**	--	**210**	--	**305**	--	**560**	--	--	--
Silver	**75.3**	--	**66.7**	--	**74.1**	--	--	**85**	--	--
Strontium	**31,800**	--	**34,700**	--	**30,100**	--	--	**28,900**	--	--
Toluene	--	**0.236**	--	**0.337**	--	**0.284**	--	--	**0.232**	--
Vanadium	**53,100**	--	**54,600**	--	**50,000**	--	--	**58,800**	--	--
Xylenes (total)	--	0.20	--	0.21	--	0.20	--	--	--	0.16
Zinc	**41,900**	--	**39,800**	--	**42,200**	--	--	**44,800**	--	--

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-4. Sample Concentrations for Nonradiological Contaminants at Exposure Area F + G.

Well Name	C7468									C7472									
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N7**	**B236N8**	**B236P0**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**																		
1-Butanol	--	22.9	--	12.5	--	7.69	14.4	--	--	--	--	--	8.52	--	10.5	10.1	--	11.1	--
2-Butanone	--	3.91	--	2.15	--	1.32	2.46	--	--	--	--	--	1.63	--	2.01	**2.5**	--	**2.47**	--
Acetone	--	6.44	--	3.53	--	2.17	4.06	--	--	--	--	--	1.82	--	2.25	2.16	--	2.37	--
Aldrin	--	--	--	--	--	--	--	--	--	--	--	0.32	--	--	--	--	--	--	0.76
Aluminum	**6,030,000**	--	**5,190,000**	--	**4,480,000**	--	--	--	**7,000,000**	**6,460,000**	--	--	--	**6,500,000**	--	--	**7,440,000**	--	**5,860,000**
Antimony	165	--	162	--	171	--	--	**182**	--	**245**	--	--	--	**262**	--	--	**120**	--	200
Aroclor-1254	19.2	--	18.9	--	19	--	--	--	18.1	--	--	6.4	--	19.6	--	--	18.4	--	19
Aroclor-1260	19.2	--	**20.6**	--	19	--	--	--	18.1	--	--	6.4	--	19.6	--	--	18.4	--	19
Arsenic	**3,480**	--	**2,070**	--	**1,920**	--	--	**3,410**	--	**3,420**	--	--	--	**4,300**	--	--	**2,300**	--	**2,460**
Barium	**68,700**	--	**40,600**	--	**75,400**	--	--	--	**129,000**	**64,300**	--	--	--	**71,900**	--	--	**89,800**	--	**78,000**
Benzene	--	0.47	--	0.26	--	0.16	0.30	--	--	--	--	--	0.12	--	0.15	0.15	--	0.16	--
Beryllium	187	--	185	--	195	--	--	**298**	--	**211**	--	--	--	**185**	--	--	857	--	864
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	**25.3**	--	**21.3**	--	**23.2**	--	--	**25.2**	--	--	--	0.31	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	**1,790**	--	**2,840**	--	**7,420**	--	--	--	538	579	--	--	--	576	--	--	571	--	**667**
Butylbenzylphthalate	49.1	--	49.2	--	49.4	--	--	--	45.6	--	--	49.1	--	**48.8**	--	--	**72.6**	--	48.4
Cadmium	**119**	--	111	--	117	--	--	**143**	--	**90.2**	--	--	--	**116**	--	--	**73.3**	--	**74.5**
Carbon disulfide	--	0.44	--	0.24	--	0.15	0.28	--	--	--	--	--	0.13	--	0.16	0.16	--	0.17	--
Chromium	**8,230**	--	**9,500**	--	**4,740**	--	--	--	**8,190**	**6,480**	--	--	--	**9,120**	--	--	**9,720**	--	**6,390**
Cobalt	**6,610**	--	**5,360**	--	**7,760**	--	--	**8,760**	--	**8,740**	--	--	--	**6,040**	--	--	**6,850**	--	**8,420**
Copper	**11,400**	--	**10,700**	--	**10,100**	--	--	--	**11,000**	**12,800**	--	--	--	**12,200**	--	--	**11,200**	--	**15,600**
Fluoride	**1,220**	--	**695**	--	**1,090**	--	--	--	**1,070**	--	--	**832**	--	**3,290**	--	--	**1,650**	--	**1,740**
Gamma-BHC (Lindane)	--	--	--	--	**5.1**	--	--	--	--	0.17	--	--	--	--	--	--	--	--	--
Iron	**17,300,000**	--	**15,200,000**	--	**23,900,000**	--	--	**24,400,000**	--	**21,500,000**	--	--	--	**16,500,000**	--	--	**24,400,000**	--	**25,900,000**
Lead	**4,400**	--	**3,370**	--	**3,410**	--	--	--	**6,200**	--	--	**8,480**	--	**6,030**	--	--	5,230	--	4,380
Lithium	**7,690**	--	**6,660**	--	**3,350**	--	--	--	**7,800**	**6,090**	--	--	--	**7,910**	--	--	**6,610**	--	**4,370**
Manganese	**259,000**	--	**229,000**	--	**302,000**	--	--	--	**500,000**	**316,000**	--	--	--	**286,000**	--	--	**384,000**	--	**358,000**
Mercury	28.9	--	27.6	--	18.2	--	--	20.1	--	**30.4**	--	--	--	9.66	--	--	8.96	--	9.05
Methylene chloride	--	**2**	--	**2**	--	0.17	**2**	--	--	--	--	--	0.05	--	0.86	0.74	--	0.78	--
Molybdenum	3,740	--	3,690	--	3,890	--	--	--	3,750	2,100	--	--	--	2,140	--	--	17,100	--	17,300
Nickel	**9,050**	--	**9,010**	--	**6,400**	--	--	--	**12,400**	**11,900**	--	--	--	**11,700**	--	--	**10,400**	--	**7,510**
Nitrate	**4,680**	--	**3,250**	--	**4,750**	--	--	--	**5,340**	**4,670**	--	--	--	**11,400**	--	--	**4,090**	--	**4,470**
Nitrite	**3,010**	--	**2,110**	--	**1,470**	--	--	--	**4,080**	**2,340**	--	--	--	**1,580**	--	--	**1,180**	--	**3,300**
o-Xylene	--	0.29	--	0.16	--	0.10	0.19	--	--	--	--	--	0.08	--	**0.13**	0.09	--	0.10	--
Selenium	2,280	--	2,250	--	2,380	--	--	--	2,290	642	--	--	--	653	--	--	523	--	527
Silver	120	--	118	--	136	--	--	--	122	84.2	--	--	--	85.6	--	--	**70.7**	--	**81.8**
Strontium	**24,900**	--	**25,700**	--	**21,700**	--	--	--	**30,700**	**28,400**	--	--	--	**49,700**	--	--	**34,800**	--	**26,500**
Toluene	--	0.35	--	0.19	--	0.12	0.22	--	--	--	0.36	--	--	--	**0.98**	**0.25**	--	**0.24**	--
Vanadium	**47,200**	--	**40,900**	--	**78,500**	--	--	--	**68,500**	**41,800**	--	--	--	**31,600**	--	--	**70700**	--	**78,200**
Xylenes (total)	--	0.91	--	0.50	--	0.31	0.57	--	--	--	--	--	0.17	--	**0.46**	0.20	--	0.22	--
Zinc	**35,500**	--	**28,500**	--	**34,900**	--	--	--	**43,100**	**38,200**	--	--	--	**33,400**	--	--	**33,400**	--	**37,000**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-5. Sample Concentrations for Nonradiological Contaminants at Exposure Area H + I.

Well Name	C7680										C7682									
Sample ID	B26C26	B26C27	B26C28	B26C29	B26C30	B26C31	B26JK8	B26JK9	B26JL8	B26JL9	B26C47	B26C48	B26C50	B26C51	B26C53	B26C54	B26JL0	B26JL1	B26JM0	B26JM1
Top (feet)	5	5	10	10	14	14	0	0	0	0	5	5	10	12	14	14	0	0	0	0
Bottom (feet)	7	7	12	12	16	16	1	1	1	1	7	7	12	14	16	16	1	1	1	1
Contaminant of Potential Concern	Sample Concentration (µg/kg)																			
1-Butanol	--	9.78	--	9.48	--	12.00	--	--	8.48	--	--	8.77	10.40	--	--	11.30	--	--	--	8.84
2-Butanone	--	1.87	--	1.81	--	2.29	--	--	--	1.62	--	1.67	1.99	--	--	2.16	--	--	--	1.69
Acetone	--	2.09	--	2.03	--	2.57	--	--	1.81	--	--	1.87	2.23	--	--	2.42	--	--	--	1.89
Aldrin	0.63	--	0.98	--	0.97	--	--	0.64	--	--	0.34	--	--	0.32	0.95	--	--	0.32	--	--
Aluminum	**7,730,000**	--	**4,590,000**	--	**6,930,000**	--	**7,310,000**	--	--	--	**5,640,000**	--	--	**6,030,000**	**6,380,000**	--	--	**6,100,000**	--	--
Antimony	**202**	--	**77.9**	--	**111**	--	**214**	--	--	--	**420**	--	--	**110**	**89.7**	--	--	**218**	--	--
Aroclor-1254	20	--	20	--	19	--	--	13	--	--	6.8	--	--	6.5	24	--	--	6.4	--	--
Aroclor-1260	20	--	20	--	19	--	--	13	--	--	6.8	--	--	6.5	24	--	--	6.4	--	--
Arsenic	**3,670**	--	**3,030**	--	**2,950**	--	**4,920**	--	--	--	**5,000**	--	--	**3,000**	**2,000**	--	--	**7,000**	--	--
Barium	**80,600**	--	**75,900**	--	**89,700**	--	**77,700**	--	--	--	**71,000**	--	--	**89,600**	**103,000**	--	--	**82,200**	--	--
Benzene	--	0.14	--	0.14	--	0.17	--	--	0.12	--	--	0.13	0.15	--	--	0.16	--	--	--	0.13
Beryllium	**199**	--	99.6	--	**136**	--	**190**	--	--	--	**204**	--	--	**159**	**190**	--	--	**212**	--	--
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	0.62	--	0.96	--	0.95	--	--	0.62	--	--	0.33	--	--	0.32	0.93	--	0.31	--	--	--
Bis(2-ethylhexyl) phthalate	590	--	589	--	590	--	568	--	--	--	587	--	--	590	585	--	--	588	--	--
Butylbenzylphthalate	50	--	49.9	--	50	--	48.1	--	--	--	49.7	--	--	50	**200**	--	--	49.8	--	--
Cadmium	**87.7**	--	**70.2**	--	**66.1**	--	**84.8**	--	--	--	**196**	--	--	**136**	**127**	--	**100.00**	--	--	--
Carbon disulfide	--	0.15	--	0.15	--	0.19	--	--	0.13	--	--	0.14	0.16	--	--	0.18	--	--	--	0.14
Chromium	**10,100**	--	**5,340**	--	**26,800**	--	**9,090**	--	--	--	**7,710**	--	--	**10,100**	**14,900**	--	--	**7,550**	--	--
Cobalt	**7,990**	--	**11,300**	--	**10,300**	--	**8,140**	--	--	--	**6,680**	--	--	**9,840**	**10,600**	--	--	**7,850**	--	--
Copper	**9,970**	--	**13,500**	--	**11,200**	--	**11,300**	--	--	--	**11,900**	--	--	**11,300**	**11,300**	--	--	**11,800**	--	--
Fluoride	**1,070**	--	**372**	--	**1,500**	--	**846**	--	--	--	**1,600**	--	--	**1,450**	**1,490**	--	--	**2,100**	--	--
Gamma-BHC (Lindane)	0.35	--	0.54	--	0.53	--	--	0.35	--	--	0.19	--	--	0.18	0.52	--	--	0.18	--	--
Iron	**22,200,000**	--	**31,200,000**	--	**26,800,000**	--	**22,300,000**	--	--	--	**14,300,000**	--	--	**22,800,000**	**24,000,000**	--	--	**16,300,000**	--	--
Lead	**5,150**	--	**2,460**	--	**3,370**	--	**5,330**	--	--	--	**11,300**	--	--	**6,860**	**6,640**	--	--	**7,000**	--	--
Lithium	**7,230**	--	**3,560**	--	**6,800**	--	**7,810**	--	--	--	**6,570**	--	--	**5,990**	**7,040**	--	--	**8,010**	--	--
Manganese	**346,000**	--	**387,000**	--	**424,000**	--	**332,000**	--	--	--	**270,000**	--	--	**383,000**	**465,000**	--	--	**332,000**	--	--
Mercury	9.51	--	9.08	--	9.14	--	9.37	--	--	--	9.75	--	--	8.96	8.16	--	--	8.75	--	--
Methylene chloride	--	0.06	--	0.06	--	0.07	--	--	0.05	--	--	0.05	0.06	--	--	0.07	--	--	--	0.06
Molybdenum	2,000	--	1,990	--	1,970	--	--	1,970	--	--	1,660	--	--	**1,980**	**2,000**	--	--	1,650	--	--
Nickel	**8,650**	--	**6,610**	--	**18,300**	--	**11,100**	--	--	--	**8,930**	--	--	**10,400**	**12,300**	--	--	**9,610**	--	--
Nitrate	**11,200**	--	**2,750**	--	**7,740**	--	--	**11,500**	--	--	**23,800**	--	--	**12,200**	**12,800**	--	--	**54,600**	--	--
Nitrite	**736**	--	**613**	--	**1,120**	--	**232**	--	--	--	192	--	--	**1,850**	**1,340**	--	--	**1,210**	--	--
o-Xylene	--	0.09	--	0.08	--	0.11	--	--	0.08	--	--	0.08	0.09	--	--	0.10	--	--	--	0.08
Selenium	**523**	--	**965**	--	**602**	--	**615**	--	--	--	**1,000**	--	--	**1,000**	**1,000**	--	--	**1,000**	--	--
Silver	**62.4**	--	**59.1**	--	**61.8**	--	**66.7**	--	--	--	100	--	--	100	100	--	--	100	--	--
Strontium	**23,700**	--	**20,200**	--	**35,100**	--	**32,600**	--	--	--	**21,500**	--	--	**31,100**	**37,700**	--	--	**30,500**	--	--
Toluene	--	**0.39**	--	0.52	--	**0.60**	--	--	**0.27**	--	--	**0.31**	**0.35**	--	--	**1.05**	--	--	**0.39**	--
Vanadium	**52,300**	--	**82,600**	--	**75,100**	--	**53,400**	--	--	--	**24,500**	--	--	**52,300**	**53,800**	--	--	**27,000**	--	--
Xylenes (total)	--	0.19	--	0.19	--	0.24	--	--	0.17	--	--	0.17	0.21	--	--	0.22	--	--	--	0.18
Zinc	**42,400**	--	**53,000**	--	**42,800**	--	**43,000**	--	--	--	**29,500**	--	--	**36,100**	**38,100**	--	--	**36,400**	--	--

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-6. Sample Concentrations for Nonradiological Contaminants at Exposure Area J. (2 sheets)

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**			
Aldrin	--	0.33	0.31	0.31
Aluminum	**7,740,000**	--	**6,890,000**	**6,910,000**
Antimony	**219**	--	**233**	**2,160**
Aroclor-1254	--	5	5.05	4.51
Aroclor-1260	--	8.08	8.16	7.28
Arsenic	**3,270**	--	**5,290**	**7,890**
Barium	**244,000**	--	**79,500**	**77,800**
Beryllium	**328**	--	**160**	**134**
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	--	0.32	0.3	0.3
Bis(2-ethylhexyl) phthalate	579	--	585	**2,070**
Butylbenzylphthalate	49	--	49.5	**77.8**
Cadmium	**102**	--	**113**	**84**
Chromium	**10,500**	--	**11,600**	**9,580**
Cobalt	**6,340**	--	**6,950**	**8,270**
Copper	--	**12,100**	**12,200**	**13,800**
Fluoride	**502**	--	**1,040**	**1,530**
Gamma-BHC (Lindane)	--	0.18	0.17	0.17
Iron	**18,700,000**	--	**21,600,000**	**24,100,000**
Lead	**5,290**	--	**4,900**	**5,000**
Lithium	**8,680**	--	**7,460**	**7,300**
Manganese	--	**287,000**	**340,000**	**383,000**
Mercury	--	**16.2**	9.14	**11.5**
Molybdenum	1,830	--	1,920	1,910
Nickel	**13,700**	--	**10,200**	**10,700**
Nitrate	**3,240**	--	**9,230**	**8,920**
Nitrite	--	**1,550**	**2,500**	**1,220**

Table G-1-6. Sample Concentrations for Nonradiological Contaminants at Exposure Area J. (2 sheets)

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Contaminant of Potential Concern (continued)	**Sample Concentration (µg/kg) (continued)**			
Selenium	1,230	--	1,300	1,290
Silver	**62.4**	--	**57.7**	**58.8**
Strontium	**125,000**	--	**33,100**	**33,800**
Thallium	--	**67.4**	**82.3**	**81.7**
Vanadium	**41,900**	--	**47,700**	**54,300**
Zinc	**34,300**	--	**43,400**	**52,300**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-7. Sample Concentrations for Nonradiological Contaminants at Exposure Area L1 + L2.

Well Name	C7466									C7670									
Sample ID	B20XW6	B20XW8	B20XW9	B20XX1	B20XX2	B20XX4	B211Y0	B215K8	B215K9	B238J9	B23KN4	B23KN6	B23KN7	B23KN9	B23KP2	B23KP6	B23KP8	B23R25	B25CN2
Top (feet)	5	5	10	10	14	14	0	0	0	5	5	0	0	0	10	14	14	0	10
Bottom (feet)	7	7	12	12	16	16	1	1	1	7	7	1	1	1	12	16	16	1	14
Contaminant of Potential Concern	Sample Concentration (µg/kg)																		
1-Butanol	--	12	--	14.1	--	13.2	7.69	--	--	--	10.5	--	--	**22.2**	9.82	--	8.55	--	--
2-Butanone	--	2.05	--	2.42	--	2.25	1.32	--	--	--	2.01	1.62	--	--	1.87	--	1.63	--	--
Acetone	--	3.37	--	3.98	--	3.71	2.17	--	--	--	2.25	1.81	--	--	**46.2**	--	1.83	--	--
Aldrin	--	--	--	--	--	--	--	--	--	0.31	--	--	--	--	--	0.35	--	0.33	0.36
Aluminum	--	--	**5,410,000**	--	**5,110,000**	--	--	--	**7,070,000**	**5,590,000**	--	--	**6,710,000**	--	--	**5,370,000**	--	--	**5,250,000**
Antimony	173	--	174	--	156	--	--	--	**500**	**96.8**	--	--	--	--	--	**74.1**	--	**286**	**80**
Aroclor-1254	18.6	--	15.7	--	18.3	--	--	--	18.7	6.2	--	--	--	--	--	6.9	--	6.6	7.1
Aroclor-1260	18.6	--	15.7	--	18.3	--	--	--	18.7	6.2	--	--	--	--	--	6.9	--	6.6	7.1
Arsenic	**4,070**	--	**1,800**	--	**2,030**	--	--	--	**3,690**	**2,200**	--	--	**4,520**	--	--	**2,590**	--	--	**2,360**
Barium	**106,000**	--	**46,600**	--	**53,400**	--	--	--	**84,700**	**70,100**	--	--	--	--	--	**55,400**	--	**86,300**	**51,100**
Benzene	--	0.25	--	0.29	--	0.27	0.16	--	--	--	0.15	0.12	--	--	0.14	--	0.12	--	--
Beryllium	197	--	198	--	177	--	--	--	185	**144**	--	--	--	--	--	**111**	--	**216**	**117**
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	**19.4**	--	**19.6**	--	**22.4**	--	--	--	**23.4**	0.3	--	--	--	--	--	0.34	--	0.32	0.35
Bis(2-ethylhexyl) phthalate	**1,840**	--	587	--	582	--	--	--	562	584	--	--	531	--	--	581	--	--	589
Butylbenzylphthalate	48.2	--	49.7	--	**53.6**	--	--	--	**59.2**	49.5	--	--	45	--	--	76.2	--	--	80.4
Cadmium	**104**	--	**32.3**	--	**60.3**	--	--	--	**120**	**61.1**	--	--	--	--	--	**54.6**	--	**101**	**72.5**
Carbon disulfide	--	0.23	--	0.27	--	0.25	0.15	--	--	--	0.16	0.13	--	--	0.15	--	0.13	--	--
Chromium	**11,100**	--	**7,540**	--	**8,500**	--	--	--	**7,960**	**10,600**	--	--	**7,570**	--	--	**8,360**	--	--	**8,590**
Cobalt	**10,700**	--	**4,340**	--	**5,640**	--	--	**8,370**	--	**5,320**	--	--	**8,810**	--	--	**5,500**	--	--	**5,450**
Copper	**15,100**	--	**8,020**	--	**9,650**	--	--	--	**11,200**	**11,000**	--	--	--	--	--	**9,660**	--	**11,500**	**10,200**
Fluoride	**1,660**	--	**688**	--	**379**	--	--	**567**	--	**1,110**	--	--	**1,360**	--	--	**1,130**	--	--	**940**
Gamma-BHC (Lindane)	--	--	--	--	--	--	--	--	--	0.17	--	--	--	--	--	0.19	--	0.18	0.2
Iron	**25,900,000**	--	**12,600,000**	--	**16,800,000**	--	--	--	**22,300,000**	**16,000,000**	--	--	**20,100,000**	--	--	**16,000,000**	--	--	**15,900,000**
Lead	**4,960**	--	**3,040**	--	**3,630**	--	--	--	**6,430**	**3,080**	--	--	**6,280**	--	--	**3,520**	--	--	**4,270**
Lithium	**7,440**	--	**6,820**	--	**5,550**	--	--	--	**6,640**	**6,320**	--	--	--	--	--	**6,850**	--	**7,280**	**6,500**
Manganese	**450,000**	--	**169,000**	--	**243,000**	--	--	--	**39,3000**	**241,000**	--	--	--	--	--	**259,000**	--	**348,000**	**238,000**
Mercury	48.1	--	45	--	40.7	--	--	40.6	--	9.34	--	--	8.63	--	--	**17.1**	--	--	**10.2**
Methylene chloride	--	0.26	--	0.31	--	0.29	0.17	--	--	--	0.07	0.05	--	--	0.06	--	0.05	--	--
Molybdenum	3,940	--	3,950	--	3,540	--	--	--	3,710	2,090	--	--	2,110	--	--	**2,260**	--	--	**2,450**
Nickel	**13,100**	--	**7,330**	--	**8,060**	--	--	--	**18,400**	**10,600**	--	--	**11,500**	--	--	**7,700**	--	--	**8,180**
Nitrate	**12,000**	--	**3,640**	--	**1,920**	--	--	--	**6,000**	**5,870**	--	--	--	--	--	**3,690**	--	**4,080**	**3,990**
Nitrite	**2,540**	--	**5,180**	--	240	--	--	**1,930**	--	**2,420**	--	--	643	--	--	**1,250**	--	--	**1,790**
o-Xylene	--	0.15	--	0.18	--	0.17	0.10	--	--	--	0.09	0.08	--	--	0.09	--	0.08	--	--
Selenium	240	--	241	--	216	--	--	--	226	637	--	--	643	--	--	656	--	--	**1,350**
Silver	**102**	--	**52**	--	**65.9**	--	--	--	**91.3**	83.6	--	--	84.3	--	--	86.1	--	--	81.6
Strontium	**32,700**	--	**26,300**	--	**19,000**	--	--	--	**31,100**	**28,100**	--	--	**33,300**	--	--	**26,900**	--	--	**25,900**
Toluene	--	0.19	--	0.22	--	0.20	0.12	--	--	--	0.60	0.36	--	--	0.33	--	0.35	--	--
Vanadium	**66,700**	--	**35,500**	--	**52,200**	--	--	--	**71,600**	**32,000**	--	--	**37,900**	--	--	**33,500**	--	--	**32,600**
Xylenes (total)	--	0.48	--	0.56	--	0.53	0.31	--	--	--	0.21	0.17	--	--	0.19	--	0.17	--	--
Zinc	**43,400**	--	**24,200**	--	**29,100**	--	--	--	**42,200**	**28,300**	--	--	**36,800**	--	--	**33,700**	--	--	**29,300**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-8. Sample Concentrations for Nonradiological Contaminants at Exposure Area P.

Well Name	C6392		C6400				C6402						C6404			C6406					
Sample ID	B1YT69	B1YT71	B1YTF8	B1YTF9	B1YTH1	B1YTH3	B20XV5	B20XV7	B20XV9	B20XW1	B20XW3	B20XW5	B1YT90	B1YT92	B1YT93	B1YTC7	B1YTC9	B1YTD0	B1YTD2	B1YTD3	B1YTD5
Top (feet)	14	14	10	5	5	10	6	6	10	10	14	14	6	6	10	5	5	10	10	14	14
Bottom (feet)	16	16	12	7	7	12	8	8	12	12	16	16	8	8	12	7	7	12	12	16	16
Contaminant of Potential Concern	Sample Concentration (µg/kg)																				
1-Butanol	18.5	--	17.7	13.9	--	--	--	12.5	--	13.2	--	13.4	10.2	--	13	25.9	--	24.3	--	10.5	--
2-Butanone	3.17	--	3.02	2.38	--	--	--	2.15	--	2.25	--	2.29	1.75	--	2.22	4.43	--	4.16	--	1.8	--
Acetone	**9.39**	--	**12.6**	**6.99**	--	--	--	3.53	--	**4.2**	--	**4.18**	2.88	--	3.65	**12.3**	--	**13.1**	--	2.96	--
Aluminum	--	**7,800,000**	--	--	**5,850,000**	**5,830,000**	**7,600,000**	--	**7,260,000**	--	**6,720,000**	--	--	**5,810,000**	--	--	**7,180,000**	--	**6,870,000**	--	**5,650,000**
Antimony	--	**184**	--	--	167	167	**174**	--	149	--	164	--	--	171	--	--	168	--	**367**	--	161
Aroclor-1254	--	10	--	--	20.7	20.2	20.4	--	19.3	--	19.1	--	--	--	--	--	--	--	21	--	20.6
Aroclor-1260	--	10	--	--	20.7	**25.2**	20.4	--	**26.8**	--	19.1	--	--	--	--	--	--	--	21	--	20.6
Arsenic	--	**5,620**	--	--	**3,980**	**3,830**	**4,800**	--	**4,410**	--	**5,160**	--	--	**4,310**	--	--	**4,190**	--	**5,900**	--	**1,790**
Barium	--	**7,7100**	--	--	**66,100**	**85,400**	**82,900**	--	**75,100**	--	**68,200**	--	--	**68,800**	--	--	**86,100**	--	**82,500**	--	**79,900**
Benzene	0.38	--	0.36	0.29	--	--	--	0.26	--	0.27	--	0.28	0.21	--	0.27	0.53	--	0.50	--	0.22	--
Beryllium	--	1,010	--	--	**191**	190	**315**	--	**295**	--	**237**	--	--	194	--	--	**248**	--	**275**	--	183
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	--	--	--	--	**25.8**	**22.5**	**21.2**	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.5**
Bis(2-ethylhexyl) phthalate	--	556	--	--	592	599	--	--	**804**	--	--	--	--	**2,300**	--	--	583	--	586	--	549
Butylbenzylphthalate	--	47.1	--	--	50.2	50.8	--	--	50	--	--	--	--	48	--	--	49.4	--	49.7	--	46.5
Cadmium	--	**125**	--	--	**112**	**145**	**128**	--	**106**	--	**105**	--	--	**88.5**	--	--	**99.1**	--	**108**	--	**76.8**
Carbon disulfide	0.36	--	0.34	0.27	--	--	--	0.24	--	0.25	--	0.26	0.20	--	0.25	0.50	--	0.47	--	0.20	--
Chromium	--	**8,230**	--	--	**5,480**	**4,470**	**8,700**	--	**9,080**	--	**9,660**	--	--	**6,800**	--	--	**9,260**	--	**10,600**	--	**21,800**
Cobalt	--	**8,960**	--	--	**7,660**	**8,170**	**8,330**	--	**9,890**	--	**8,320**	--	--	**6,370**	--	--	**8,600**	--	**9,240**	--	**9,900**
Copper	--	**12,500**	--	--	**12,400**	**11,900**	**12,900**	--	**13,200**	--	**12,600**	--	--	**11,300**	--	--	**12,400**	--	**12,600**	--	**12,800**
Fluoride	--	**4,760**	--	--	**1,910**	**1,970**	--	--	**1,890**	--	**2,390**	--	--	**2,390**	--	--	**1,340**	--	**1,690**	--	**1,410**
Iron	--	**25,100,000**	--	--	**21,000,000**	**20,000,000**	**24,900,000**	--	**24,200,000**	--	**22,300,000**	--	--	**20,700,000**	--	--	**22,400,000**	--	**24,300,000**	--	**30,500,000**
Lead	--	**7,740**	--	--	**5,790**	**5,620**	**7,280**	--	**6,870**	--	**7,790**	--	--	**6,150**	--	--	**8,060**	--	**7,620**	--	**2,930**
Lithium	--	**8,300**	--	--	**6,300**	**5,630**	**9,420**	--	**8,470**	--	**8,450**	--	--	**6,740**	--	--	**8,460**	--	**8,230**	--	**4,190**
Manganese	--	**369,000**	--	--	**298,000**	**346,000**	**385,000**	--	**358,000**	--	**305,000**	--	--	**291,000**	--	--	**349,000**	--	**385,000**	--	**356,000**
Mercury	--	17.5	--	--	**19.2**	10.8	12.5	--	10.9	--	12.8	--	--	10.2	--	--	10.5	--	10.4	--	10.6
Methylene chloride	0.41	--	0.39	0.30	--	--	--	0.27	--	0.29	--	0.29	0.22	--	0.28	**1.14**	--	**0.80**	--	**2.61**	--
Molybdenum	--	20,200	--	--	3,790	3,800	3,680	--	3,860	--	3,670	--	--	3,880	--	--	3,820	--	3,420	--	3,650
Nickel	--	**12,300**	--	--	**8,580**	**9,110**	**6,710**	--	**7,160**	--	**7,390**	--	--	**9,510**	--	--	**9,650**	--	**12,500**	--	**13,900**
Nitrate	--	**13,600**	--	--	**8,080**	**5,720**	--	--	**9,010**	--	**17,500**	--	--	**3,700**	--	--	**9,840**	--	**4,890**	--	**5,490**
Nitrite	--	1,240	--	--	**5,160**	**4,370**	--	--	**3,690**	--	**5,760**	--	--	**1,670**	--	--	**4,800**	--	**2,600**	--	**3,420**
o-Xylene	0.24	--	0.23	0.18	--	--	--	0.16	--	0.17	--	0.17	0.13	--	0.17	0.33	--	0.31	--	0.14	--
Selenium	--	246	--	--	231	232	231	--	207	--	227	--	--	237	--	--	233	--	209	--	223
Silver	--	137	--	--	**101**	**100**	**207**	--	**208**	--	**223**	--	--	**160**	--	--	153	--	**149**	--	146
Strontium	--	**32,300**	--	--	**26,600**	**27,200**	**30,300**	--	**29,500**	--	**28,000**	--	--	**26,300**	--	--	**39,100**	--	**37,300**	--	**27,400**
Toluene	**0.29**	--	0.27	0.21	--	--	--	0.19	--	0.20	--	0.21	0.16	--	0.20	0.40	--	0.38	--	0.16	--
Vanadium	--	**60,200**	--	--	**58,300**	**58,400**	**78,000**	--	**60,600**	--	**71,400**	--	--	**56,700**	--	--	**60,800**	--	**62,400**	--	**110,000**
Xylenes (total)	0.74	--	0.71	0.55	--	--	--	0.50	--	0.53	--	0.53	0.41	--	0.52	1.03	--	0.97	--	0.42	--
Zinc	--	**48,600**	--	--	**39,500**	**305,000**	**43,900**	--	**44,300**	--	**42,500**	--	--	**39,900**	--	--	**40,900**	--	**42,700**	--	**44,000**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-9. Sample Concentrations for Nonradiological Contaminants at Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**							
1-Butanol	--	9.93	--	--	12.1	8.38	600	--
2-Butanone	--	1.9	--	--	2.3	1.6	1	--
Acetone	--	2.12	--	--	2.58	**2.53**	**6.4**	--
Aldrin	--	--	0.32	--	--	--	--	--
Aluminum	--	--	**7,700,000**	**8,390,000**	--	--	--	**6,770,000**
Antimony	--	--	**245**	--	--	--	--	**161**
Aroclor-1254	--	--	6.3	--	--	--	--	--
Aroclor-1260	--	--	6.3	--	--	--	--	--
Arsenic	--	--	**5,250**	**5,830**	--	--	--	**4,900**
Barium	--	--	**73,200**	**79,200**	--	--	--	**66,800**
Benzene	--	0.14	--	--	0.17	0.12	0.6	--
Beryllium	--	--	**156**	**175**	--	--	--	**166**
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	--	--	0.31	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	558	--	--	584	--	--	--	585
Butylbenzylphthalate	--	--	**76.1**	**107**	--	--	--	109
Cadmium	--	--	**3,020**	**3,470**	--	--	--	**2,990**
Carbon disulfide	--	0.16	--	--	0.19	0.13	0.6	--
Chromium	--	--	**9,250**	**11,200**	--	--	--	**10,000**
Cobalt	--	--	**10,500**	**10,500**	--	--	--	**8,370**
Copper	--	--	**13,500**	**14,800**	--	--	--	**11,000**
Fluoride	--	--	**964**	**2,690**	--	--	--	**3,530**

Table G-1-9. Sample Concentrations for Nonradiological Contaminants at Exposure Area R. (2 sheets)

Well Name	C7668							
Sample ID	B23TK2	B23TK4	B23TK5	B23TK8	B23TL0	B23TL6	B23TM2	B27130
Contaminant of Potential Concern (continued)	Sample Concentration (µg/kg) (continued)							
Gamma-BHC (Lindane)	--	--	0.17	--	--	--	--	--
Iron	--	--	**25,800,000**	**25,900,000**	--	--	--	**22,100,000**
Lead	--	--	**8,450**	**6,300**	--	--	--	**4,310**
Lithium	--	--	**8,000**	**9,050**	--	--	--	**7,290**
Manganese	--	--	**386,000**	**409,000**	--	--	--	**331,000**
Mercury	--	--	**13.5**	7.78	--	--	--	7.85
Methylene chloride	--	0.06	--	--	0.07	0.05	**1.4**	--
Molybdenum	--	--	2,110	2,090	--	--	--	2,180
Nickel	--	--	**11,000**	**10,900**	--	--	--	**8,690**
Nitrate	--	--	**6,710**	**9,210**	--	--	--	**39,700**
Nitrite	--	--	**5,310**	**387**	--	--	--	1,900
Selenium	**701**	--	--	**594**	--	--	--	**685**
Silver	**53**	--	--	**51.9**	--	--	--	**69.4**
Strontium	--	--	**31,000**	**37,300**	--	--	--	**29,900**
Toluene	--	**0.59**	--	--	**0.34**	**0.32**	0.6	--
Vanadium	--	--	**64,200**	**64,100**	--	--	--	**55,600**
Xylenes (total)	--	0.20	--	--	0.24	0.17	1	--
Zinc	--	--	**47,800**	**48,600**	--	--	--	**45,300**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

Table G-1-10. Sample Concentrations for Nonradiological Contaminants at Exposure Area U. (2 sheets)

Well Name	**C7676**								
Sample ID	**B26CC0**	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**9**	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
Contaminant of Potential Concern	**Sample Concentration (µg/kg)**								
1-Butanol	--	8.53	--	9.88	10.8	--	--	9.27	--
2-Butanone	--	1.63	--	1.89	2.06	--	--	1.77	--
Acetone	--	1.82	--	**6.18**	**5.96**	--	--	1.98	--
Aldrin	0.32	--	0.32	--	--	--	0.31	--	--
Aluminum	--	--	**4,960,000**	--	--	**6,910,000**	--	--	**8,270,000**
Antimony	--	--	**151**	--	--	**229**	--	--	**291**
Aroclor-1254	6.4	--	6.3	--	--	--	6.3	--	--
Aroclor-1260	6.4	--	6.3	--	--	--	6.3	--	--
Arsenic	--	--	**3,000**	--	--	--	**4,000**	--	**7,000**
Barium	--	--	**48,100**	--	--	**96,900**	--	--	**83,600**
Benzene	--	0.12	--	0.14	**0.33**	--	--	0.13	--
Beryllium	--	--	**126**	--	--	--	**222**	--	**235**
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	0.32	--	0.31	--	--	--	0.31	--	--
Bis(2-ethylhexyl) phthalate	--	--	578	--	--	--	570	--	589
Butylbenzylphthalate	--	--	48.9	--	--	--	48.3	--	49.9
Cadmium	--	--	100	--	--	90	--	--	100
Carbon disulfide	--	0.13	--	0.15	0.17	--	--	0.15	--
Chromium	--	--	**8,510**	--	--	**7,460**	--	--	**10,000**
Cobalt	--	--	**5,540**	--	--	**8,510**	--	--	**8,730**
Copper	--	--	**9,080**	--	--	--	**11,500**	--	**13,200**

Table G-1-10. Sample Concentrations for Nonradiological Contaminants at Exposure Area U. (2 sheets)

Well Name	C7676								
Sample ID	B26CC0	B26CC1	B26CC4	B26CC5	B26CC7	B26JK6	B26JK7	B26JL7	B29612
Contaminant of Potential Concern (continued)	Sample Concentration (µg/kg) (continued)								
Fluoride	--	--	**2,020**	--	--	**402**	--	--	**1,810**
Gamma-BHC (Lindane)	0.18	--	0.17	--	--	--	0.17	--	--
Iron	--	--	**15,500,000**	--	--	**20,900,000**	--	--	**23,100,000**
Lead	--	--	**3,000**	--	--	--	**4,000**	--	**7,000**
Lithium	--	--	**5,520**	--	--	--	**7,360**	--	**9,240**
Manganese	--	--	**226,000**	--	--	**304,000**	--	--	**364,000**
Mercury	--	--	9.66	--	--	--	**20.6**	--	**10.2**
Methylene chloride	--	0.05	--	0.06	0.07	--	--	0.06	--
Molybdenum	--	--	1,980	--	--	**2,380**	--	--	**2,530**
Nickel	--	--	**6,680**	--	--	**8,780**	--	--	**9,800**
Nitrate	--	--	**6,590**	--	--	**8,510**	--	--	**7,370**
Nitrite	--	--	**671**	--	--	--	**982**	--	**2,190**
o-Xylene	--	0.0763	--	0.0883	0.0966	--	--	0.0829	--
Selenium	--	--	**1,000**	--	--	--	**1,000**	--	**2,000**
Silver	--	--	100	--	--	90	--	--	100
Strontium	--	--	**23,000**	--	--	--	**49,600**	--	**36,800**
Toluene	--	**0.584**	--	**0.555**	**0.704**	--	--	**0.738**	--
Vanadium	--	--	**38,800**	--	--	**50,000**	--	--	**51,900**
Xylenes (total)	--	0.17	--	0.20	0.21	--	--	0.18	--
Zinc	--	--	**28,500**	--	--	**40,900**	--	--	**45,300**

Bold font represents detected sample result
Regular font represents non-detected sample results
"--" represents not analyzed

ATTACHMENT G-2

NONRADIOLOGICAL RISK EVALUATION RESULTS FOR WASHINGTON ADMINISTRATIVE CODE INDUSTRIAL WORKER

Table G-2-1. Carcinogenic Risk Assessment Results for Exposure Area A + B. (2 sheets)

Well Name	C8102					C8104				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR**									
Aluminum	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—
Aroclor-1254	—	1E-09	—	—	—	—	—	—	1E-09	—
Arsenic	—	3E-07	4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	—
Barium	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—
Diethylphthalate	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—

Table G-2-1. Carcinogenic Risk Assessment Results for Exposure Area A + B. (2 sheets)

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
COPC (continued)	**COPC-Specific ELCR (continued)**									
Silver	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	3E-07	4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	—
$ELCR_{SampleDepth}$	3E-07		4E-07	3E-07	4E-07	3E-07	3E-07	3E-07	6E-07	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-2-2. Carcinogenic Risk Assessment Results for Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR**			
Aluminum	—	—	—	—
Antimony	—	—	—	—
Arsenic	—	8E-07	2E-06	4E-07
Barium	—	—	—	—
Beryllium	—	—	—	—
Butylbenzylphthalate	—	1E-11	—	—
Cadmium	—	—	—	—
Chromium	—	—	—	—
Cobalt	—	—	—	—
Copper	—	—	—	—
Fluoride	—	—	—	—
Iron	—	—	—	—
Lithium	—	—	—	—
Manganese	—	—	—	—
Mercury	—	—	—	—
Nickel	—	—	—	—
Nitrate	—	—	—	—
Nitrite	—	—	—	—
Silver	—	—	—	—
Strontium	—	—	—	—
Vanadium	—	—	—	—
Zinc	—	—	—	—
$ELCR_{Sample}$	—	8E-07	2E-06	4E-07
$ELCR_{Sample}$ $_{Depth}$	8E-07		2E-06	4E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-2-3. Carcinogenic Risk Assessment Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR**								
Acetone	—	—	—	—	—	—	—	—	—
Aldrin	—	—	3E-09	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—
Arsenic	6E-07	—	4E-07	—	3E-07	—	—	6E-07	—
Barium	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—
Boron	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	2E-11	—	—	—	2E-11	—	2E-11	—	—
Cadmium	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—

Table G-2-3. Carcinogenic Risk Assessment Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific ELCR (continued)**								
Mercury	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	6E-07	—	4E-07	—	3E-07	—	2E-11	6E-07	—
$ELCR_{Sample}$Depth	6E-07		4E-07		3E-07		6E-07		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-2-4. Carcinogenic Risk Assessment Results for Exposure Area F + G.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific ELCR**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	3E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	4E-07	—	2E-07	—	2E-07	—	—	—	4E-07	—	4E-07	—	5E-07	—	—	3E-07	—	3E-07
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	3E-09	—	3E-09	—	3E-09	—	—	—	3E-09	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	2E-09	—	3E-09	—	8E-09	—	—	—	—	—	—	—	—	—	—	—	—	7E-10
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	7E-12	—	—	1E-11	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gamma-BHC (Lindane)	—	—	—	—	4E-10	—	—	—	—	—	—	—	—	—	—	—	—	—
Hexane	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	3E-13	—	3E-13	—	—	—	3E-13	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	4E-07	3E-13	2E-07	3E-13	2E-07	—	—	3E-13	4E-07	—	4E-07	—	5E-07	—	—	3E-07	—	3E-07
$ELCR_{Sample}$Depth	4E-07		2E-07		2E-07		4E-07				4E-07		5E-07		—	3E-07		3E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-2-5. Carcinogenic Risk Assessment Results for Exposure Area H + I.

Well Name	**C7680**								**C7682**								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR**																
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	4E-07	—	3E-07	3E-07	—	6E-07	—	—	6E-07	—	—	3E-07	2E-07	—	—	8E-07	—
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-11	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	4E-07	—	3E-07	3E-07	—	—	—	—	6E-07	—	—	3E-07	2E-07	—	—	8E-07	—
$ELCR_{Sample_{Depth}}$	4E-07		3E-07	3E-07		6E-07			6E-07		—	3E-07	2E-07		8E-07		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-2-6. Carcinogenic Risk Assessment Results for Exposure Area J.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR**			
Aluminum	—	—	—	—
Antimony	—	—	—	—
Arsenic	4E-07	—	6E-07	9E-07
Barium	—	—	—	—
Beryllium	—	—	—	—
Bis(2-ethylhexyl) phthalate	—	—	—	2E-09
Boron	—	—	—	—
Butylbenzylphthalate	—	—	—	1E-11
Cadmium	—	—	—	—
Chromium	—	—	—	—
Cobalt	—	—	—	—
Copper	—	—	—	—
Fluoride	—	—	—	—
Iron	—	—	—	—
Lithium	—	—	—	—
Manganese	—	—	—	—
Mercury	—	—	—	—
Nickel	—	—	—	—
Nitrate	—	—	—	—
Nitrite	—	—	—	—
Silver	—	—	—	—
Strontium	—	—	—	—
Tin	—	—	—	—
Vanadium	—	—	—	—
Zinc	—	—	—	—
$ELCR_{Sample}$	4E-07	—	6E-07	9E-07
$ELCR_{Sample}$Depth	4E-07		6E-07	9E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

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Table G-2-7. Carcinogenic Risk Assessment Results for Exposure Area L1 + L2.

Well Name	**C7466**									**C7670**						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific ELCR**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	5E-07	—	2E-07	—	2E-07	—	—	—	4E-07	3E-07	5E-07	—	—	—	3E-07	3E-07
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	3E-09	—	3E-09	—	3E-09	—	—	—	3E-09	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	2E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	8E-12	—	—	—	9E-12	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hexane	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	5E-07	—	2E-07	—	2E-07	—	—	—	4E-07	3E-07	5E-07	—	—	—	3E-07	3E-07
$ELCR_{Sample_{Depth}}$	5E-07		2E-07		2E-07		4E-07			3E-07	5E-07			—	3E-07	3E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-2-8. Carcinogenic Risk Assessment Results for Exposure Area P.

Well Name	**C6392**		**C6400**				**C6402**					**C6404**	**C6406**					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific ELCR**																	
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	—	—	—	4E-09	—	4E-09	—	—	—	—	—	—	—	—	—	—
Arsenic	—	6E-07	—	—	5E-07	4E-07	5E-07	5E-07	—	6E-07	—	5E-07	—	5E-07	—	7E-07	—	2E-07
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	—	—	—	—	4E-09	3E-09	3E-09	—	—	—	—	—	—	—	—	—	—	3E-09
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	9E-10	—	—	—	2E-09	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-13	—	1E-13	—	4E-13	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	6E-07	—	—	5E-07	4E-07	6E-07	5E-07	—	6E-07	—	5E-07	2E-13	5E-07	1E-13	7E-07	4E-13	2E-07
$ELCR_{Sample_{Depth}}$	6E-07		—	5E-07		4E-07	6E-07	5E-07		6E-07		5E-07	5E-07		7E-07		2E-07	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-2-9. Carcinogenic Risk Assessment Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific ELCR**							
2-Hexanone	—	—	—	—	—	—	—	—
Acetone	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—
Arsenic	—	—	6E-07	7E-07	—	—	—	6E-07
Barium	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	1E-11	2E-11	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—

Table G-2-9. Carcinogenic Risk Assessment Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific ELCR (continued)**							
Methylene chloride	—	—	—	—	—	—	2E-13	—
Nickel	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	—	6E-07	7E-07	—	—	2E-13	6E-07
$ELCR_{SampleDepth}$	6E-07			7E-07		—	2E-13	6E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-2-10. Carcinogenic Risk Assessment Results for Exposure Area U.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR**							
Acetone	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—
Arsenic	—	3E-07	—	—	—	5E-07	—	8E-07
Barium	—	—	—	—	—	—	—	—
Benzene	—	—	—	1E-12	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—
Boron	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	3E-07	—	1E-12	—	5E-07	—	8E-07
$ELCR_{Sample}$Depth	—	3E-07		1E-12	5E-07			8E-07

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available

ATTACHMENT G-3

NONRADIOLOGICAL RISK EVALUATION RESULTS FOR WASHINGTON ADMINISTRATIVE CODE RESIDENTIAL RECEPTOR

Table G-3-1. Carcinogenic Risk Assessment Results for Exposure Area A + B.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific ELCR**									
Aluminum	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—
Aroclor-1254	—	1E-08	—	—	—	—	—	—	2E-08	—
Arsenic	—	4E-06	5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	—
Barium	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—
Diethylphthalate	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	4E-06	5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	—
$ELCR_{Sample_{Depth}}$	4E-06		5E-06	4E-06	5E-06	4E-06	4E-06	4E-06	8E-06	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-3-2. Carcinogenic Risk Assessment Results for Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific ELCR**			
Aluminum	—	—	—	—
Antimony	—	—	—	—
Arsenic	—	1E-05	3E-05	6E-06
Barium	—	—	—	—
Beryllium	—	—	—	—
Butylbenzylphthalate	—	2E-10	—	—
Cadmium	—	—	—	—
Chromium	—	—	—	—
Cobalt	—	—	—	—
Copper	—	—	—	—
Fluoride	—	—	—	—
Iron	—	—	—	—
Lithium	—	—	—	—
Manganese	—	—	—	—
Mercury	—	—	—	—
Nickel	—	—	—	—
Nitrate	—	—	—	—
Nitrite	—	—	—	—
Silver	—	—	—	—
Strontium	—	—	—	—
Vanadium	—	—	—	—
Zinc	—	—	—	—
$ELCR_{Sample}$	—	1E-05	3E-05	6E-06
$ELCR_{Sample}$Depth	**1E-05**		**3E-05**	6E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-3-3. Carcinogenic Risk Assessment Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR**								
Acetone	—	—	—	—	—	—	—	—	—
Aldrin	—	—	3E-08	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—
Arsenic	8E-06	—	5E-06	—	4E-06	—	—	8E-06	—
Barium	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—
Boron	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	2E-10	—	—	—	2E-10	—	2E-10	—	—
Cadmium	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—

Table G-3-3. Carcinogenic Risk Assessment Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific ELCR (continued)**								
Mercury	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	8E-06	—	5E-06	—	4E-06	—	2E-10	8E-06	—
$ELCR_{SampleDepth}$	8E-06		5E-06		4E-06		8E-06		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-3-4. Carcinogenic Risk Assessment Results for Exposure Area F + G.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific ELCR**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	4E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	5E-06	—	3E-06	—	3E-06	—	—	—	5E-06	—	5E-06	—	6E-06	—	—	3E-06	—	4E-06
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	5E-08	—	4E-08	—	4E-08	—	—	—	5E-08	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-08	—	4E-08	—	1E-07	—	—	—	—	—	—	—	—	—	—	—	—	9E-09
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	9E-11	—	—	1E-10	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gamma-BHC (Lindane)	—	—	—	—	6E-09	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	4E-12	—	4E-12	—	—	—	4E-12	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	5E-06	4E-12	3E-06	4E-12	3E-06	—	—	4E-12	5E-06	—	5E-06	—	6E-06	—	—	3E-06	—	4E-06
$ELCR_{Sample}$ $_{Depth}$	5E-06		3E-06		3E-06		5E-06				5E-06		6E-06		—	3E-06		4E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-3-5. Carcinogenic Risk Assessment Results for Exposure Area H + I.

Well Name	**C7680**								**C7682**								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific ELCR**																
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	6E-06	—	5E-06	4E-06	—	7E-06	—	—	8E-06	—	—	5E-06	3E-06	—	—	1E-05	—
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	4E-10	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	6E-06	—	5E-06	4E-06	—	7E-06	—	—	8E-06	—	—	5E-06	3E-06	—	—	1E-05	—
$ELCR_{Sample}$ $_{Depth}$	6E-06		5E-06	4E-06		7E-06			8E-06		—	5E-06	3E-06		**1E-05**		

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-3-6. Carcinogenic Risk Assessment Results for Exposure Area J.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific ELCR**			
Aluminum	—	—	—	—
Antimony	—	—	—	—
Arsenic	5E-06	—	8E-06	1E-05
Barium	—	—	—	—
Beryllium	—	—	—	—
Bis(2-ethylhexyl) phthalate	—	—	—	3E-08
Boron	—	—	—	—
Butylbenzylphthalate	—	—	—	1E-10
Cadmium	—	—	—	—
Chromium	—	—	—	—
Cobalt	—	—	—	—
Copper	—	—	—	—
Fluoride	—	—	—	—
Iron	—	—	—	—
Lithium	—	—	—	—
Manganese	—	—	—	—
Mercury	—	—	—	—
Nickel	—	—	—	—
Nitrate	—	—	—	—
Nitrite	—	—	—	—
Silver	—	—	—	—
Strontium	—	—	—	—
Tin	—	—	—	—
Vanadium	—	—	—	—
Zinc	—	—	—	—
$ELCR_{Sample}$	5E-06	—	8E-06	1E-05
$ELCR_{SampleDepth}$	5E-06		8E-06	**1E-05**

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

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Table G-3-7. Carcinogenic Risk Assessment Results for Exposure Area L1 + L2.

Well Name	**C7466**									**C7670**						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific ELCR**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	6E-06	—	3E-06	—	3E-06	—	—	—	6E-06	3E-06	7E-06	—	—	—	4E-06	4E-06
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	3E-08	—	4E-08	—	4E-08	—	—	—	4E-08	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	1E-10	—	—	—	1E-10	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	6E-06	—	3E-06	—	3E-06	—	—	—	6E-06	3E-06	7E-06	—	—	—	4E-06	4E-06
$ELCR_{Sample}$Depth	6E-06		3E-06		3E-06		6E-06			3E-06	7E-06			—	4E-06	4E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-3-8. Carcinogenic Risk Assessment Results for Exposure Area P.

Well Name	**C6392**		**C6400**				**C6402**					**C6404**	**C6406**					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific ELCR**																	
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aroclor-1260	—	—	—	—	—	5E-08	—	5E-08	—	—	—	—	—	—	—	—	—	—
Arsenic	—	8E-06	—	—	6E-06	6E-06	7E-06	7E-06	—	8E-06	—	6E-06	—	6E-06	—	9E-06	—	3E-06
Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
beta-BHC	—	—	—	—	5E-08	4E-08	4E-08	—	—	—	—	—	—	—	—	—	—	4E-08
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	1E-08	—	—	—	3E-08	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-12	—	2E-12	—	5E-12	—
Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	8E-06	—	—	6E-06	6E-06	7E-06	7E-06	—	8E-06	—	6E-06	2E-12	6E-06	2E-12	9E-06	5E-12	3E-06
$ELCR_{Sample Depth}$	8E-06		—	6E-06		6E-06	7E-06	7E-06		8E-06		6E-06	6E-06		9E-06		3E-06	

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk "—" means either sample results are non-detect or no carcinogenic slope factors are available

Table G-3-9. Carcinogenic Risk Assessment Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific ELCR**							
2-Hexanone	—	—	—	—	—	—	—	—
Acetone	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—
Arsenic	—	—	8E-06	9E-06	—	—	—	7E-06
Barium	—	—	—	—	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	1E-10	2E-10	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—

Table G-3-9. Carcinogenic Risk Assessment Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific ELCR (continued)**							
Methylene chloride	—	—	—	—	—	—	3E-12	—
Nickel	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	—	8E-06	9E-06	—	—	3E-12	7E-06
$ELCR_{SampleDepth}$	8E-06			9E-06		—	3E-12	7E-06

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

Table G-3-10. Carcinogenic Risk Assessment Results for Exposure Area U.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific ELCR**							
Acetone	—	—	—	—	—	—	—	—
Aluminum	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—
Arsenic	—	5E-06	—	—	—	6E-06	—	1E-05
Barium	—	—	—	—	—	—	—	—
Benzene	—	—	—	2E-11	—	—	—	—
Beryllium	—	—	—	—	—	—	—	—
Boron	—	—	—	—	—	—	—	—
Chromium	—	—	—	—	—	—	—	—
Cobalt	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—
Fluoride	—	—	—	—	—	—	—	—
Iron	—	—	—	—	—	—	—	—
Lithium	—	—	—	—	—	—	—	—
Manganese	—	—	—	—	—	—	—	—
Mercury	—	—	—	—	—	—	—	—
Molybdenum	—	—	—	—	—	—	—	—
Nickel	—	—	—	—	—	—	—	—
Nitrate	—	—	—	—	—	—	—	—
Nitrite	—	—	—	—	—	—	—	—
Selenium	—	—	—	—	—	—	—	—
Strontium	—	—	—	—	—	—	—	—
Styrene	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—
Vanadium	—	—	—	—	—	—	—	—
Zinc	—	—	—	—	—	—	—	—
$ELCR_{Sample}$	—	5E-06	—	2E-11	—	6E-06	—	1E-05
$ELCR_{Sample}$ $_{Depth}$	—	5E-06		2E-11	6E-06			**1E-05**

COPC = contaminant of potential concern ELCR = excess lifetime cancer risk

"—" means either sample results are non-detect or no carcinogenic slope factors are available.

ATTACHMENT G-4

NONRADIOLOGICAL HAZARD EVALUATION RESULTS FOR WASHINGTON ADMINISTRATIVE CODE INDUSTRIAL WORKER

Table G-4-1. Non-Cancer Hazard Results for Exposure Area A + B.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**									
Aluminum	—	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	—
Antimony	—	2E-04	2E-04	2E-04	2E-04	9E-05	8E-05	1E-04	2E-04	—
Aroclor-1254	—	9E-05	—	—	—	—	—	—	1E-04	—
Arsenic	—	2E-03	3E-03	3E-03	3E-03	2E-03	3E-03	2E-03	5E-03	—
Barium	—	1E-04	1E-04	9E-05	1E-04	1E-04	1E-04	1E-04	1E-04	—
Cadmium	—	3E-05	3E-05	2E-05	3E-05	1E-05	1E-05	1E-05	—	2E-05
Chromium	—	1E-06	1E-06	2E-06	1E-06	1E-06	2E-06	2E-06	2E-06	—
Cobalt	—	8E-03	6E-03	6E-03	9E-03	7E-03	7E-03	6E-03	1E-02	—
Copper	8E-05	—	8E-05	8E-05	9E-05	9E-05	8E-05	8E-05	1E-04	—
Diethylphthalate	—	—	—	—	—	—	—	—	1E-07	—
Fluoride	—	3E-06	1E-05	4E-06	1E-05	—	—	—	—	—
Iron	—	9E-03	9E-03	9E-03	1E-02	9E-03	9E-03	1E-02	1E-02	—
Lithium	—	1E-03	1E-03	1E-03	1E-03	1E-03	1E-03	1E-03	—	1E-03
Manganese	—	7E-04	7E-04	7E-04	8E-04	7E-04	6E-04	7E-04	8E-04	—
Nickel	1E-04	—	1E-04	2E-04	1E-04	1E-04	1E-04	2E-04	1E-04	—
Nitrate	—	2E-07	6E-07	2E-07	4E-07	—	—	2E-07	7E-08	—
Nitrite	—	1E-06	8E-07	3E-07	3E-07	—	—	—	—	—
Silver	—	3E-06	3E-06	3E-06	3E-06	2E-06	2E-06	2E-06	3E-06	—
Strontium	—	2E-05	2E-05	1E-05	1E-05	2E-05	1E-05	2E-05	2E-05	—
Tin	—	3E-06	—	6E-06	5E-06	—	—	—	—	—
Vanadium	—	3E-03	3E-03	3E-03	4E-03	3E-03	3E-03	3E-03	—	3E-03
Zinc	—	4E-05	4E-05	4E-05	5E-05	4E-05	4E-05	4E-05	4E-05	—
HI	2E-04	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	4E-03
HI_{Sample} $_{Depth}$	0.03		0.03	0.03	0.03	0.03	0.03	0.03	0.03	

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-2. Non-Cancer Hazard Results for Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific Hazard Quotient**			
Aluminum	2E-03	—	3E-03	3E-03
Antimony	—	2E-04	5E-04	1E-04
Arsenic	—	6E-03	2E-02	4E-03
Barium	1E-04	—	1E-04	1E-04
Beryllium	5E-05	—	6E-05	5E-05
Butylbenzylphthalate	—	1E-07	—	—
Cadmium	—	3E-05	4E-05	3E-05
Chromium	2E-06	—	2E-06	2E-06
Cobalt	9E-03	—	9E-03	1E-02
Copper	—	9E-05	1E-04	1E-04
Fluoride	3E-06	—	1E-05	1E-05
Iron	9E-03	—	1E-02	1E-02
Lithium	—	1E-03	2E-03	1E-03
Manganese	8E-04	—	8E-04	9E-04
Mercury	—	5E-06	—	4E-06
Nickel	2E-04	—	2E-04	2E-04
Nitrate	—	2E-07	7E-07	4E-07
Nitrite	2E-06	—	2E-06	1E-06
Silver	3E-06	—	5E-06	2E-06
Strontium	—	2E-05	2E-05	2E-05
Vanadium	—	3E-03	3E-03	4E-03
Zinc	4E-05	—	5E-05	4E-05
HI	2E-02	1E-02	5E-02	4E-02
$\mathbf{HI}_{\mathbf{Sample}\,\mathrm{Depth}}$	0.03		0.05	0.04

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available. Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-3. Non-Cancer Hazard Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**								
Acetone	—	1E-09	—	2E-09	—	2E-09	—	—	—
Aldrin	—	—	2E-05	—	—	—	—	—	—
Aluminum	2E-03	—	2E-03	—	2E-03	—	—	2E-03	—
Antimony	1E-04	—	7E-05	—	1E-04	—	1E-04	—	—
Arsenic	5E-03	—	3E-03	—	3E-03	—	—	5E-03	—
Barium	1E-04	—	1E-04	—	1E-04	—	—	1E-04	—
Beryllium	2E-05	—	2E-05	—	2E-05	—	2E-05	—	—
Boron	—	—	5E-06	—	—	—	—	5E-06	—
Butylbenzylphthalate	2E-07	—	—	—	2E-07	—	2E-07	—	—
Cadmium	8E-04	—	8E-04	—	9E-04	—	—	9E-04	—
Chromium	2E-06	—	3E-06	—	2E-06	—	—	2E-06	—
Cobalt	8E-03	—	8E-03	—	7E-03	—	—	8E-03	—
Copper	9E-05	—	1E-04	—	9E-05	—	—	9E-05	—
Fluoride	7E-06	—	7E-06	—	6E-06	—	—	5E-06	—
Iron	9E-03	—	9E-03	—	9E-03	—	—	1E-02	—
Lithium	1E-03	—	1E-03	—	1E-03	—	1E-03	—	—
Manganese	7E-04	—	7E-04	—	6E-04	—	1E-03	—	—

Table G-4-3. Non-Cancer Hazard Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific Hazard Quotient (continued)**								
Mercury	—	—	—	—	—	—	—	2E-05	—
Nickel	1E-04	—	2E-04	—	2E-04	—	1E-04	—	—
Nitrate	2E-07	—	1E-07	—	1E-07	—	—	2E-07	—
Nitrite	1E-06	—	1E-06	—	7E-07	—	—	1E-06	—
Selenium	2E-05	—	1E-05	—	2E-05	—	3E-05	—	—
Silver	4E-06	—	4E-06	—	4E-06	—	—	5E-06	—
Strontium	2E-05	—	2E-05	—	1E-05	—	—	1E-05	—
Toluene	—	8E-10	—	1E-09	—	1E-09	—	—	8E-10
Vanadium	3E-03	—	3E-03	—	3E-03	—	—	3E-03	—
Zinc	4E-05	—	4E-05	—	4E-05	—	—	4E-05	—
HI	3E-02	2E-09	3E-02	3E-09	3E-02	3E-09	3E-03	3E-02	8E-10
HI_{Sample}Depth	0.03		0.03		0.03		0.03		

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-4. Non-Cancer Hazard Results for Exposure Area F + G.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-09	—	1E-09	—
Aluminum	2E-03	—	1E-03	—	1E-03	—	—	—	—	2E-03	2E-03	—	2E-03	—	—	2E-03	—	2E-03
Antimony	—	—	—	—	—	—	—	—	1E-04	—	2E-04	—	2E-04	—	—	9E-05	—	—
Aroclor-1260	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	3E-03	—	—	—	2E-03	—	—	—	3E-03	—	3E-03	—	4E-03	—	—	2E-03	—	2E-03
Barium	1E-04	—	—	—	1E-04	—	—	—	—	2E-04	9E-05	—	1E-04	—	—	1E-04	—	1E-04
Beryllium	—	—	—	—	—	—	—	—	4E-05	—	3E-05	—	3E-05	—	—	—	—	—
beta-BHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-05	—	—	—	1E-04	—	—	—	—	—	—	—	—	—	—	—	—	1E-05
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	7E-08	—	—	1E-07	—	—
Cadmium	3E-05	—	—	—	—	—	—	—	4E-05	—	3E-05	—	3E-05	—	—	2E-05	—	2E-05
Chromium	2E-06	—	2E-06	—	9E-07	—	—	—	—	2E-06	1E-06	—	2E-06	—	—	2E-06	—	1E-06
Cobalt	6E-03	—	5E-03	—	7E-03	—	—	—	8E-03	—	8E-03	—	6E-03	—	—	7E-03	—	8E-03
Copper	8E-05	—	8E-05	—	7E-05	—	—	—	—	8E-05	9E-05	—	9E-05	—	—	8E-05	—	1E-04
Fluoride	6E-06	—	3E-06	—	5E-06	—	—	—	—	5E-06	—	4E-06	2E-05	—	—	8E-06	—	8E-06
Gamma-BHC (Lindane)	—	—	—	—	5E-06	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	7E-03	—	6E-03	—	1E-02	—	—	—	1E-02	—	9E-03	—	7E-03	—	—	1E-02	—	1E-02
Lithium	1E-03	—	1E-03	—	5E-04	—	—	—	—	1E-03	9E-04	—	1E-03	—	—	9E-04	—	6E-04
Manganese	5E-04	—	5E-04	—	6E-04	—	—	—	—	1E-03	6E-04	—	6E-04	—	—	8E-04	—	7E-04
Mercury	—	—	—	—	—	—	—	—	—	—	3E-05	—	—	—	—	—	—	—
Methylene chloride	—	1E-07	—	1E-07	—	—	—	1E-07	—	—	—	—	—	—	—	—	—	—
Nickel	1E-04	—	1E-04	—	9E-05	—	—	—	—	2E-04	2E-04	—	2E-04	—	—	1E-04	—	1E-04
Nitrate	2E-07	—	1E-07	—	2E-07	—	—	—	—	2E-07	2E-07	—	5E-07	—	—	2E-07	—	2E-07
Nitrite	3E-06	—	2E-06	—	1E-06	—	—	—	—	4E-06	2E-06	—	2E-06	—	—	1E-06	—	3E-06
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-10	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4E-06	—	5E-06
Strontium	1E-05	—	1E-05	—	1E-05	—	—	—	—	1E-05	1E-05	—	2E-05	—	—	2E-05	—	1E-05
Styrene	—	9E-10	—	4E-10	—	4E-10	—	4E-10	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	3E-06	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-09	9E-10	—	9E-10	—
Vanadium	3E-03	—	2E-03	—	4E-03	—	—	—	—	4E-03	2E-03	—	2E-03	—	—	4E-03	—	4E-03
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	7E-10	—	—	—	—
Zinc	3E-05	—	3E-05	—	3E-05	—	—	—	—	4E-05	4E-05	—	3E-05	—	—	3E-05	—	4E-05
HI	2E-02	1E-07	2E-02	1E-07	3E-02	4E-10	0E+00	1E-07	2E-02	9E-03	3E-02	4E-06	2E-02	4E-09	2E-09	3E-02	2E-09	3E-02
$HI_{Sample Depth}$	0.02		0.02		0.03		0.03				0.03		0.02		<0.01	0.03		0.03

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-5. Non-Cancer Hazard Results for Exposure Area H + I.

Well Name	C7680								C7682								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**																
Aluminum	2E-03	—	1E-03	2E-03	—	2E-03	—	—	2E-03	—	—	2E-03	2E-03	—	—	2E-03	—
Antimony	1E-04	—	6E-05	8E-05	—	2E-04	—	—	3E-04	—	—	8E-05	6E-05	—	—	2E-04	—
Arsenic	3E-03	—	3E-03	3E-03	—	5E-03	—	—	5E-03	—	—	3E-03	2E-03	—	—	7E-03	—
Barium	1E-04	—	1E-04	1E-04	—	1E-04	—	—	1E-04	—	—	1E-04	1E-04	—	—	1E-04	—
Beryllium	3E-05	—	—	2E-05	—	3E-05	—	—	3E-05	—	—	2E-05	3E-05	—	—	3E-05	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-07	—	—	—	—
Cadmium	3E-05	—	2E-05	2E-05	—	2E-05	—	—	6E-05	—	—	4E-05	4E-05	—	3E-05	—	—
Chromium	2E-06	—	1E-06	5E-06	—	2E-06	—	—	1E-06	—	—	2E-06	3E-06	—	—	1E-06	—
Cobalt	8E-03	—	1E-02	1E-02	—	8E-03	—	—	6E-03	—	—	9E-03	1E-02	—	—	7E-03	—
Copper	7E-05	—	1E-04	8E-05	—	8E-05	—	—	9E-05	—	—	8E-05	8E-05	—	—	8E-05	—
Di-n-butylphthalate	—	—	—	—	—	—	2E-06	—	—	—	—	—	—	—	—	—	—
Fluoride	5E-06	—	2E-06	7E-06	—	4E-06	—	—	8E-06	—	—	7E-06	7E-06	—	—	1E-05	—
Iron	9E-03	—	1E-02	1E-02	—	9E-03	—	—	6E-03	—	—	9E-03	1E-02	—	—	7E-03	—
Lithium	1E-03	—	5E-04	1E-03	—	1E-03	—	—	9E-04	—	—	9E-04	1E-03	—	—	1E-03	—
Manganese	7E-04	—	8E-04	9E-04	—	7E-04	—	—	6E-04	—	—	8E-04	9E-04	—	—	7E-04	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	1E-04	1E-04	—	—	—	—
Nickel	1E-04	—	9E-05	3E-04	—	2E-04	—	—	1E-04	—	—	1E-04	2E-04	—	—	1E-04	—
Nitrate	5E-07	—	1E-07	3E-07	—	—	5E-07	—	1E-06	—	—	5E-07	5E-07	—	—	2E-06	—
Nitrite	7E-07	—	6E-07	1E-06	—	2E-07	—	—	—	—	—	2E-06	1E-06	—	—	1E-06	—
Selenium	3E-05	—	6E-05	3E-05	—	4E-05	—	—	6E-05	—	—	6E-05	6E-05	—	—	6E-05	—
Silver	4E-06	—	3E-06	4E-06	—	4E-06	—	—	—	—	—	—	—	—	—	—	—
Strontium	1E-05	—	1E-05	2E-05	—	2E-05	—	—	1E-05	—	—	1E-05	2E-05	—	—	1E-05	—
Styrene	—	5E-10	—	—	4E-10	—	—	4E-10	—	5E-10	5E-10	—	—	7E-10	—	—	6E-10
Toluene	—	1E-09	—	—	2E-09	—	—	1E-09	—	1E-09	1E-09	—	—	4E-09	—	—	1E-09
Vanadium	3E-03	—	5E-03	4E-03	—	3E-03	—	—	1E-03	—	—	3E-03	3E-03	—	—	2E-03	—
Zinc	4E-05	—	5E-05	4E-05	—	4E-05	—	—	3E-05	—	—	3E-05	4E-05	—	—	3E-05	—
HI	3E-02	2E-09	3E-02	3E-02	3E-09	3E-02	2E-06	1E-09	2E-02	2E-09	2E-09	3E-02	3E-02	4E-09	3E-05	3E-02	2E-09
HI_{Sample}Depth	0.03		0.03	0.03		0.03			0.02		<0.01	0.03	0.03		0.03		

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-6. Non-Cancer Hazard Results for Exposure Area J.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific Hazard Quotient**			
Aluminum	2E-03	—	2E-03	2E-03
Antimony	2E-04	—	2E-04	2E-03
Arsenic	3E-03	—	5E-03	8E-03
Barium	3E-04	—	1E-04	1E-04
Beryllium	5E-05	—	2E-05	2E-05
Bis(2-ethylhexyl) phthalate	—	—	—	3E-05
Boron	6E-05	—	8E-06	1E-05
Butylbenzylphthalate	—	—	—	1E-07
Cadmium	3E-05	—	3E-05	2E-05
Chromium	2E-06	—	2E-06	2E-06
Cobalt	6E-03	—	7E-03	8E-03
Copper	—	9E-05	9E-05	1E-04
Fluoride	2E-06	—	5E-06	7E-06
Iron	8E-03	—	9E-03	1E-02
Lithium	1E-03	—	1E-03	1E-03
Manganese	—	6E-04	7E-04	8E-04
Mercury	—	2E-05	—	1E-05
Nickel	2E-04	—	1E-04	2E-04
Nitrate	1E-07	—	4E-07	4E-07
Nitrite	—	1E-06	2E-06	1E-06
Silver	4E-06	—	3E-06	3E-06
Strontium	6E-05	—	2E-05	2E-05
Tin	1E-06	—	2E-06	—
Vanadium	2E-03	—	3E-03	3E-03
Zinc	3E-05	—	4E-05	5E-05
HI	2E-02	7E-04	3E-02	3E-02
$\mathbf{HI_{Sample}}_{\text{Depth}}$	0.02		0.03	0.03

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available. Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

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Table G-4-7. Non-Cancer Hazard Results for Exposure Area L1 + L2.

Well Name	C7466									C7670						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific Hazard Quotient**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	6E-08	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-08	—	—
Aluminum	—	—	2E-03	—	1E-03	—	—	—	2E-03	2E-03	2E-03	—	—	—	2E-03	2E-03
Antimony	—	—	—	—	—	—	—	—	4E-04	7E-05	—	—	2E-04	—	6E-05	5E-05
Arsenic	4E-03	—	2E-03	—	2E-03	—	—	—	4E-03	2E-03	4E-03	—	—	—	2E-03	2E-03
Barium	2E-04	—	7E-05	—	8E-05	—	—	—	1E-04	1E-04	—	—	1E-04	—	7E-05	8E-05
Beryllium	—	—	—	—	—	—	—	—	—	2E-05	—	—	3E-05	—	2E-05	2E-05
beta-BHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	3E-05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	8E-08	—	—	—	8E-08	—	—	—	—	—	—	—
Cadmium	3E-05	—	9E-06	—	2E-05	—	—	—	3E-05	2E-05	—	—	3E-05	—	2E-05	2E-05
Chromium	2E-06	—	1E-06	—	2E-06	—	—	—	2E-06	2E-06	1E-06	—	—	—	2E-06	2E-06
Cobalt	1E-02	—	4E-03	—	5E-03	—	—	8E-03	—	5E-03	8E-03	—	—	—	5E-03	5E-03
Copper	1E-04	—	6E-05	—	7E-05	—	—	—	8E-05	8E-05	—	—	8E-05	—	7E-05	7E-05
Fluoride	8E-06	—	3E-06	—	2E-06	—	—	3E-06	—	5E-06	6E-06	—	—	—	4E-06	5E-06
Iron	1E-02	—	5E-03	—	7E-03	—	—	—	9E-03	7E-03	8E-03	—	—	—	6E-03	7E-03
Lithium	1E-03	—	1E-03	—	8E-04	—	—	—	9E-04	9E-04	—	—	1E-03	—	9E-04	1E-03
Manganese	9E-04	—	3E-04	—	5E-04	—	—	—	8E-04	5E-04	—	—	7E-04	—	5E-04	5E-04
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-05	2E-05
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1E-04	1E-04
Nickel	2E-04	—	1E-04	—	1E-04	—	—	—	3E-04	2E-04	2E-04	—	—	—	1E-04	1E-04
Nitrate	5E-07	—	1E-07	—	8E-08	—	—	—	2E-07	2E-07	—	—	2E-07	—	2E-07	1E-07
Nitrite	2E-06	—	5E-06	—	—	—	—	2E-06	—	2E-06	—	—	—	—	2E-06	1E-06
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8E-05	—
Silver	6E-06	—	3E-06	—	4E-06	—	—	—	5E-06	—	—	—	—	—	—	—
Strontium	2E-05	—	1E-05	—	9E-06	—	—	—	1E-05	1E-05	2E-05	—	—	—	1E-05	1E-05
Vanadium	4E-03	—	2E-03	—	3E-03	—	—	—	4E-03	2E-03	2E-03	—	—	—	2E-03	2E-03
Zinc	4E-05	—	2E-05	—	3E-05	—	—	—	4E-05	3E-05	4E-05	—	—	—	3E-05	3E-05
HI	3E-02	0E+00	2E-02	0E+00	2E-02	0E+00	0E+00	8E-03	2E-02	2E-02	3E-02	6E-08	2E-03	1E-08	2E-02	2E-02
HI_{Sample} Depth	0.03		0.02		0.02		0.03			0.02	0.03			<0.01	0.02	0.02

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-8. Non-Cancer Hazard Results for Exposure Area P.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific Hazard Quotient**																	
Acetone	3E-09	—	4E-09	2E-09	—	—	—	—	1E-09	—	1E-09	—	4E-09	—	4E-09	—	—	—
Aluminum	—	2E-03	—	—	2E-03	2E-03	2E-03	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03
Antimony	—	1E-04	—	—	—	—	1E-04	—	—	—	—	—	—	—	—	3E-04	—	—
Aroclor-1260	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	5E-03	—	—	4E-03	4E-03	5E-03	4E-03	—	5E-03	—	4E-03	—	4E-03	—	6E-03	—	2E-03
Barium	—	1E-04	—	—	9E-05	1E-04	1E-04	1E-04	—	1E-04	—	1E-04	—	1E-04	—	1E-04	—	1E-04
Beryllium	—	—	—	—	3E-05	—	5E-05	4E-05	—	3E-05	—	—	—	4E-05	—	4E-05	—	—
beta-BHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	1E-05	—	—	—	3E-05	—	—	—	—	—	—
Cadmium	—	4E-05	—	—	3E-05	4E-05	4E-05	3E-05	—	3E-05	—	3E-05	—	3E-05	—	3E-05	—	2E-05
Chromium	—	2E-06	—	—	1E-06	9E-07	2E-06	2E-06	—	2E-06	—	1E-06	—	2E-06	—	2E-06	—	4E-06
Cobalt	—	9E-03	—	—	7E-03	8E-03	8E-03	9E-03	—	8E-03	—	6E-03	—	8E-03	—	9E-03	—	9E-03
Copper	—	9E-05	—	—	9E-05	9E-05	9E-05	9E-05	—	9E-05	—	8E-05	—	9E-05	—	9E-05	—	9E-05
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	2E-06	—	—	—	—	—	—
Fluoride	—	2E-05	—	—	9E-06	9E-06	—	9E-06	—	1E-05	—	1E-05	—	6E-06	—	8E-06	—	7E-06
Iron	—	1E-02	—	—	9E-03	8E-03	1E-02	1E-02	—	9E-03	—	8E-03	—	9E-03	—	1E-02	—	1E-02
Lithium	—	1E-03	—	—	9E-04	8E-04	1E-03	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03	—	6E-04
Manganese	—	8E-04	—	—	6E-04	7E-04	8E-04	7E-04	—	6E-04	—	6E-04	—	7E-04	—	8E-04	—	7E-04
Mercury	—	—	—	—	2E-05	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	5E-08	—	4E-08	—	1E-07	—
Nickel	—	2E-04	—	—	1E-04	1E-04	1E-04	1E-04	—	1E-04	—	1E-04	—	1E-04	—	2E-04	—	2E-04
Nitrate	—	5E-07	—	—	3E-07	2E-07	—	4E-07	—	7E-07	—	1E-07	—	4E-07	—	2E-07	—	2E-07
Nitrite	—	—	—	—	5E-06	4E-06	—	4E-06	—	5E-06	—	2E-06	—	5E-06	—	2E-06	—	3E-06
Silver	—	—	—	—	6E-06	6E-06	1E-05	1E-05	—	1E-05	—	9E-06	—	—	—	9E-06	—	—
Strontium	—	2E-05	—	—	1E-05	1E-05	1E-05	1E-05	—	1E-05	—	1E-05	—	2E-05	—	2E-05	—	1E-05
Tin	—	—	—	—	—	—	—	—	—	—	—	4E-06	—	4E-06	—	4E-06	—	7E-06
Toluene	1E-09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	3E-03	—	—	3E-03	3E-03	4E-03	3E-03	—	4E-03	—	3E-03	—	3E-03	—	4E-03	—	6E-03
Zinc	—	5E-05	—	—	4E-05	3E-04	4E-05	4E-05	—	4E-05	—	4E-05	—	4E-05	—	4E-05	—	4E-05
HI	4E-09	3E-02	4E-09	2E-09	3E-02	3E-02	3E-02	3E-02	1E-09	3E-02	1E-09	3E-02	6E-08	3E-02	4E-08	3E-02	1E-07	3E-02
HI_{Sample} $_{Depth}$	0.03		<0.01	0.03		0.03	0.03	0.03		0.03		0.03	0.03		0.03		0.03	

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-9. Non-Cancer Hazard Results for Exposure Area R. (2 sheets)

Well Name	C7668							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient**							
2-Hexanone	—	1E-07	—	—	2E-07	1E-07	—	—
Acetone	—	—	—	—	—	8E-10	2E-09	—
Aluminum	—	—	2E-03	2E-03	—	—	—	2E-03
Antimony	—	—	2E-04	—	—	—	—	1E-04
Arsenic	—	—	5E-03	6E-03	—	—	—	5E-03
Barium	—	—	1E-04	1E-04	—	—	—	1E-04
Beryllium	—	—	2E-05	3E-05	—	—	—	2E-05
Butylbenzylphthalate	—	—	1E-07	2E-07	—	—	—	—
Cadmium	—	—	9E-04	1E-03	—	—	—	9E-04
Chromium	—	—	2E-06	2E-06	—	—	—	2E-06
Cobalt	—	—	1E-02	1E-02	—	—	—	8E-03
Copper	—	—	1E-04	1E-04	—	—	—	8E-05
Fluoride	—	—	5E-06	1E-05	—	—	—	2E-05
Iron	—	—	1E-02	1E-02	—	—	—	9E-03
Lithium	—	—	1E-03	1E-03	—	—	—	1E-03
Manganese	—	—	8E-04	8E-04	—	—	—	7E-04
Mercury	—	—	1E-05	—	—	—	—	—

Table G-4-9. Non-Cancer Hazard Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific Hazard Quotient (continued)**							
Methylene chloride	—	—	—	—	—	—	7E-08	—
Nickel	—	—	2E-04	2E-04	—	—	—	1E-04
Nitrate	—	—	3E-07	4E-07	—	—	—	2E-06
Nitrite	—	—	5E-06	4E-07	—	—	—	—
Selenium	4E-05	—	—	3E-05	—	—	—	4E-05
Silver	3E-06	—	—	3E-06	—	—	—	4E-06
Strontium	—	—	1E-05	2E-05	—	—	—	1E-05
Toluene	—	2E-09	—	—	1E-09	1E-09	—	—
Vanadium	—	—	4E-03	4E-03	—	—	—	3E-03
Zinc	—	—	5E-05	5E-05	—	—	—	4E-05
HI	4E-05	1E-07	3E-02	4E-02	2E-07	1E-07	7E-08	3E-02
HI_{Sample}Depth	0.03			0.04		<0.01	<0.01	0.03

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-4-10. Non-Cancer Hazard Results for Exposure Area U.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific Hazard Quotient**							
Acetone	—	—	2E-09	2E-09	—	—	—	—
Aluminum	—	1E-03	—	—	2E-03	—	—	2E-03
Antimony	—	1E-04	—	—	2E-04	—	—	2E-04
Arsenic	—	3E-03	—	—	—	4E-03	—	7E-03
Barium	—	7E-05	—	—	1E-04	—	—	1E-04
Benzene	—	—	—	2E-08	—	—	—	—
Beryllium	—	2E-05	—	—	—	3E-05	—	3E-05
Boron	—	—	—	—	9E-06	—	—	—
Chromium	—	2E-06	—	—	1E-06	—	—	2E-06
Cobalt	—	5E-03	—	—	8E-03	—	—	8E-03
Copper	—	6E-05	—	—	—	8E-05	—	9E-05
Fluoride	—	1E-05	—	—	2E-06	—	—	9E-06
Iron	—	6E-03	—	—	9E-03	—	—	9E-03
Lithium	—	8E-04	—	—	—	1E-03	—	1E-03
Manganese	—	5E-04	—	—	6E-04	—	—	7E-04
Mercury	—	—	—	—	—	2E-05	—	1E-05
Molybdenum	—	—	—	—	1E-04	—	—	1E-04
Nickel	—	1E-04	—	—	1E-04	—	—	1E-04
Nitrate	—	3E-07	—	—	3E-07	—	—	3E-07
Nitrite	—	6E-07	—	—	—	9E-07	—	2E-06
Selenium	—	6E-05	—	—	—	6E-05	—	1E-04
Strontium	—	1E-05	—	—	—	2E-05	—	2E-05
Styrene	—	—	—	—	—	—	5E-10	—
Toluene	2E-09	—	2E-09	3E-09	—	—	3E-09	—
Vanadium	—	2E-03	—	—	3E-03	—	—	3E-03
Zinc	—	3E-05	—	—	4E-05	—	—	4E-05
HI	2E-09	2E-02	4E-09	3E-08	2E-02	5E-03	3E-09	3E-02
HI$_{\textbf{Sample}\text{Depth}}$	<0.01	0.02		<0.01	0.03			0.03

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

ATTACHMENT G-5

NONRADIOLOGICAL HAZARD EVALUATION RESULTS FOR WASHINGTON ADMINISTRATIVE CODE RESIDENTIAL RECEPTOR

Table G-5-1. Non-Cancer Hazard Results for Exposure Area A + B.

Well Name	**C8102**					**C8104**				
Sample ID	**B2B1L8**	**B2B1L9**	**B2D1X2**	**B2D1X4**	**B2D1X5**	**B2FB27**	**B2FB29**	**B2FB30**	**B2FPF1**	**B2FPF2**
Top (feet)	**0**	**0**	**5.7**	**11.5**	**16.1**	**5.7**	**11.5**	**16.1**	**0.5**	**0.5**
Bottom (feet)	**1**	**1**	**9.7**	**15.5**	**18.1**	**7.7**	**15.5**	**18.1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**									
Aluminum	—	9E-02	9E-02	8E-02	9E-02	9E-02	9E-02	1E-01	1E-01	—
Antimony	—	7E-03	7E-03	8E-03	8E-03	4E-03	4E-03	5E-03	1E-02	—
Aroclor-1254	—	4E-03	—	—	—	—	—	—	5E-03	—
Arsenic	—	1E-01	1E-01	1E-01	1E-01	1E-01	1E-01	1E-01	2E-01	—
Barium	—	6E-03	5E-03	4E-03	5E-03	4E-03	5E-03	5E-03	5E-03	—
Cadmium	—	1E-03	1E-03	1E-03	1E-03	5E-04	6E-04	5E-04	—	1E-03
Chromium	—	7E-05	6E-05	7E-05	5E-05	7E-05	8E-05	9E-05	7E-05	—
Cobalt	—	3E-01	3E-01	3E-01	4E-01	3E-01	3E-01	3E-01	5E-01	—
Copper	4E-03	—	3E-03	3E-03	4E-03	4E-03	4E-03	4E-03	4E-03	—
Diethylphthalate	—	—	—	—	—	—	—	—	5E-06	—
Fluoride	—	1E-04	6E-04	2E-04	4E-04	—	—	—	—	—
Iron	—	4E-01	4E-01	4E-01	5E-01	4E-01	4E-01	4E-01	4E-01	—
Lithium	—	5E-02	5E-02	5E-02	4E-02	5E-02	5E-02	5E-02	—	5E-02
Manganese	—	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	3E-02	—
Nickel	6E-03	—	5E-03	8E-03	5E-03	6E-03	5E-03	7E-03	6E-03	—
Nitrate	—	7E-06	3E-05	8E-06	2E-05	—	—	9E-06	3E-06	—
Nitrite	—	5E-05	4E-05	1E-05	2E-05	—	—	—	—	—
Silver	—	1E-04	1E-04	1E-04	1E-04	8E-05	7E-05	7E-05	1E-04	—
Strontium	—	9E-04	7E-04	7E-04	6E-04	7E-04	6E-04	7E-04	8E-04	—
Tin	—	1E-04	—	2E-04	2E-04	—	—	—	—	—
Vanadium	—	1E-01	1E-01	1E-01	2E-01	1E-01	1E-01	1E-01	—	1E-01
Zinc	—	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	2E-03	—
HI	1E-02	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	1E+00	2E-01
HI_{Sample}Depth	**1.2**		**1.1**	**1.1**	**1.3**	**1.1**	**1.1**	**1.2**	**1.5**	

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-2. Non-Cancer Hazard Results for Exposure Area C.

Well Name	**C8106**			
Sample ID	**B2FPR7**	**B2FPR8**	**B2FYM3**	**B2FYM4**
Top (feet)	**1**	**1**	**11**	**19**
Bottom (feet)	**1.5**	**1.5**	**13**	**21**
COPC	**COPC-Specific Hazard Quotient**			
Aluminum	1E-01	—	1E-01	1E-01
Antimony	—	9E-03	2E-02	5E-03
Arsenic	—	3E-01	9E-01	2E-01
Barium	5E-03	—	5E-03	6E-03
Beryllium	2E-03	—	3E-03	2E-03
Butylbenzylphthalate	—	5E-06	—	—
Cadmium	—	1E-03	2E-03	1E-03
Chromium	8E-05	—	9E-05	1E-04
Cobalt	4E-01	—	4E-01	5E-01
Copper	—	4E-03	6E-03	5E-03
Fluoride	1E-04	—	4E-04	5E-04
Iron	4E-01	—	4E-01	5E-01
Lithium	—	5E-02	8E-02	5E-02
Manganese	3E-02	—	4E-02	4E-02
Mercury	—	2E-04	—	2E-04
Nickel	8E-03	—	7E-03	7E-03
Nitrate	—	7E-06	3E-05	2E-05
Nitrite	9E-05	—	9E-05	5E-05
Silver	1E-04	—	2E-04	1E-04
Strontium	—	7E-04	9E-04	8E-04
Vanadium	—	1E-01	1E-01	2E-01
Zinc	2E-03	—	2E-03	2E-03
HI	9E-01	5E-01	2E+00	2E+00
HI_{Sample} $_{Depth}$	**1.4**		**2.1**	**1.6**

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available. Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-3. Non-Cancer Hazard Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**								
Acetone	—	6E-08	—	9E-08	—	7E-08	—	—	—
Aldrin	—	—	8E-04	—	—	—	—	—	—
Aluminum	9E-02	—	9E-02	—	9E-02	—	—	9E-02	—
Antimony	5E-03	—	3E-03	—	5E-03	—	6E-03	—	—
Arsenic	2E-01	—	1E-01	—	1E-01	—	—	2E-01	—
Barium	5E-03	—	5E-03	—	5E-03	—	—	5E-03	—
Beryllium	1E-03	—	1E-03	—	9E-04	—	1E-03	—	—
Boron	—	—	2E-04	—	—	—	—	2E-04	—
Butylbenzylphthalate	8E-06	—	—	—	8E-06	—	8E-06	—	—
Cadmium	3E-02	—	4E-02	—	4E-02	—	—	4E-02	—
Chromium	9E-05	—	1E-04	—	1E-04	—	—	7E-05	—
Cobalt	3E-01	—	3E-01	—	3E-01	—	—	4E-01	—
Copper	4E-03	—	5E-03	—	4E-03	—	—	4E-03	—
Fluoride	3E-04	—	3E-04	—	3E-04	—	—	2E-04	—
Iron	4E-01	—	4E-01	—	4E-01	—	—	4E-01	—
Lithium	5E-02	—	5E-02	—	4E-02	—	6E-02	—	—
Manganese	3E-02	—	3E-02	—	3E-02	—	4E-02	—	—

Table G-5-3. Non-Cancer Hazard Results for Exposure Area E. (2 sheets)

Well Name	**C7672**								
Sample ID	**B26C68**	**B26C69**	**B26C70**	**B26C71**	**B26C74**	**B26C75**	**B26JK2**	**B26JK3**	**B26JL2**
COPC (continued)	**COPC-Specific Hazard Quotient (continued)**								
Mercury	—	—	—	—	—	—	—	1E-03	—
Nickel	5E-03	—	8E-03	—	7E-03	—	6E-03	—	—
Nitrate	7E-06	—	5E-06	—	7E-06	—	—	9E-06	—
Nitrite	4E-05	—	6E-05	—	3E-05	—	—	4E-05	—
Selenium	9E-04	—	5E-04	—	8E-04	—	1E-03	—	—
Silver	2E-04	—	2E-04	—	2E-04	—	—	2E-04	—
Strontium	7E-04	—	7E-04	—	6E-04	—	—	6E-04	—
Toluene	—	4E-08	—	5E-08	—	4E-08	—	—	4E-08
Vanadium	1E-01	—	1E-01	—	1E-01	—	—	1E-01	—
Zinc	2E-03	—	2E-03	—	2E-03	—	—	2E-03	—
HI	1E+00	9E-08	1E+00	1E-07	1E+00	1E-07	1E-01	1E+00	4E-08
HI_{Sample}Depth	**1.3**		**1.2**		**1.2**		**1.4**		

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.

Table G-5-4. Non-Cancer Hazard Results for Exposure Area F + G.

Well Name	C7468										C7472							
Sample ID	**B211Y3**	**B211Y5**	**B211Y6**	**B211Y8**	**B211Y9**	**B21201**	**B21221**	**B21222**	**B215L0**	**B215L1**	**B236N5**	**B236N8**	**B236P2**	**B236P4**	**B236P7**	**B238H1**	**B238H3**	**B23KT4**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**14**	**10**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient**																	
2-Butanone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5E-08	—	5E-08	—
Aluminum	8E-02	—	6E-02	—	6E-02	—	—	—	—	9E-02	8E-02	—	8E-02	—	—	9E-02	—	7E-02
Antimony	—	—	—	—	—	—	—	—	6E-03	—	8E-03	—	8E-03	—	—	4E-03	—	—
Aroclor-1260	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arsenic	1E-01	—	9E-02	—	8E-02	—	—	—	1E-01	—	1E-01	—	2E-01	—	—	1E-01	—	1E-01
Barium	4E-03	—	3E-03	—	5E-03	—	—	—	—	8E-03	4E-03	—	4E-03	—	—	6E-03	—	5E-03
Beryllium	—	—	—	—	—	—	—	—	2E-03	—	1E-03	—	1E-03	—	—	—	—	—
beta-BHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	1E-03	—	2E-03	—	5E-03	—	—	—	—	—	—	—	—	—	—	—	—	4E-04
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	3E-06	—	—	5E-06	—	—
Cadmium	1E-03	—	—	—	—	—	—	—	2E-03	—	1E-03	—	1E-03	—	—	9E-04	—	9E-04
Chromium	7E-05	—	8E-05	—	4E-05	—	—	—	—	7E-05	5E-05	—	8E-05	—	—	8E-05	—	5E-05
Cobalt	3E-01	—	2E-01	—	3E-01	—	—	—	4E-01	—	4E-01	—	3E-01	—	—	3E-01	—	4E-01
Copper	4E-03	—	3E-03	—	3E-03	—	—	—	—	3E-03	4E-03	—	4E-03	—	—	4E-03	—	5E-03
Fluoride	3E-04	—	1E-04	—	2E-04	—	—	—	—	2E-04	—	2E-04	7E-04	—	—	3E-04	—	4E-04
Gamma-BHC (Lindane)	—	—	—	—	2E-04	—	—	—	—	—	—	—	—	—	—	—	—	—
Iron	3E-01	—	3E-01	—	4E-01	—	—	—	4E-01	—	4E-01	—	3E-01	—	—	4E-01	—	5E-01
Lithium	5E-02	—	4E-02	—	2E-02	—	—	—	—	5E-02	4E-02	—	5E-02	—	—	4E-02	—	3E-02
Manganese	2E-02	—	2E-02	—	3E-02	—	—	—	—	4E-02	3E-02	—	3E-02	—	—	3E-02	—	3E-02
Mercury	—	—	—	—	—	—	—	—	—	—	1E-03	—	—	—	—	—	—	—
Methylene chloride	—	4E-06	—	4E-06	—	—	—	4E-06	—	—	—	—	—	—	—	—	—	—
Nickel	6E-03	—	6E-03	—	4E-03	—	—	—	—	8E-03	7E-03	—	7E-03	—	—	7E-03	—	5E-03
Nitrate	8E-06	—	6E-06	—	8E-06	—	—	—	—	9E-06	8E-06	—	2E-05	—	—	7E-06	—	8E-06
Nitrite	1E-04	—	9E-05	—	6E-05	—	—	—	—	2E-04	1E-04	—	7E-05	—	—	5E-05	—	1E-04
o-Xylene	—	—	—	—	—	—	—	—	—	—	—	—	—	8E-09	—	—	—	—
Silver	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-04	—	2E-04
Strontium	5E-04	—	5E-04	—	5E-04	—	—	—	—	6E-04	6E-04	—	1E-03	—	—	7E-04	—	6E-04
Styrene	—	4E-08	—	2E-08	—	2E-08	—	2E-08	—	—	—	—	—	—	—	—	—	—
Tin	—	—	—	—	—	—	—	—	—	1E-04	—	—	—	—	—	—	—	—
Toluene	—	—	—	—	—	—	—	—	—	—	—	—	—	2E-07	4E-08	—	4E-08	—
Vanadium	1E-01	—	1E-01	—	2E-01	—	—	—	—	2E-01	1E-01	—	8E-02	—	—	2E-01	—	2E-01
Xylenes (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-08	—	—	—	—
Zinc	1E-03	—	1E-03	—	1E-03	—	—	—	—	2E-03	2E-03	—	1E-03	—	—	1E-03	—	2E-03
HI	1E+00	4E-06	8E-01	4E-06	1E+00	2E-08	—	4E-06	1E+00	4E-01	1E+00	2E-04	1E+00	2E-07	9E-08	1E+00	9E-08	1E+00
$HI_{Sample Depth}$	**1.0**		0.8		**1.1**		**1.3**				**1.2**		**1.0**		<0.01	**1.2**		**1.3**

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-5. Non-Cancer Hazard Results for Exposure Area H + I.

Well Name	**C7680**								**C7682**								
Sample ID	**B26C26**	**B26C27**	**B26C28**	**B26C30**	**B26C31**	**B26JK8**	**B26JK9**	**B26JL8**	**B26C47**	**B26C48**	**B26C50**	**B26C51**	**B26C53**	**B26C54**	**B26JL0**	**B26JL1**	**B26JM0**
Top (feet)	**5**	**5**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**5**	**10**	**12**	**14**	**14**	**0**	**0**	**0**
Bottom (feet)	**7**	**7**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**7**	**12**	**14**	**16**	**16**	**1**	**1**	**1**
COPC	**COPC-Specific Hazard Quotient**																
Aluminum	1E-01	—	6E-02	9E-02	—	9E-02	—	—	7E-02	—	—	8E-02	8E-02	—	—	8E-02	—
Antimony	6E-03	—	2E-03	3E-03	—	7E-03	—	—	1E-02	—	—	3E-03	3E-03	—	—	7E-03	—
Arsenic	2E-01	—	1E-01	1E-01	—	2E-01	—	—	2E-01	—	—	1E-01	8E-02	—	—	3E-01	—
Barium	5E-03	—	5E-03	6E-03	—	5E-03	—	—	4E-03	—	—	6E-03	6E-03	—	—	5E-03	—
Beryllium	1E-03	—	—	9E-04	—	1E-03	—	—	1E-03	—	—	1E-03	1E-03	—	—	1E-03	—
Butylbenzylphthalate	—	—	—	—	—	—	—	—	—	—	—	—	1E-05	—	—	—	—
Cadmium	1E-03	—	9E-04	8E-04	—	1E-03	—	—	2E-03	—	—	2E-03	2E-03	—	1E-03	—	—
Chromium	8E-05	—	4E-05	2E-04	—	8E-05	—	—	6E-05	—	—	8E-05	1E-04	—	—	6E-05	—
Cobalt	3E-01	—	5E-01	4E-01	—	3E-01	—	—	3E-01	—	—	4E-01	4E-01	—	—	3E-01	—
Copper	3E-03	—	4E-03	4E-03	—	4E-03	—	—	4E-03	—	—	4E-03	4E-03	—	—	4E-03	—
Di-n-butylphthalate	—	—	—	—	—	—	7E-05	—	—	—	—	—	—	—	—	—	—
Fluoride	2E-04	—	8E-05	3E-04	—	2E-04	—	—	3E-04	—	—	3E-04	3E-04	—	—	4E-04	—
Iron	4E-01	—	6E-01	5E-01	—	4E-01	—	—	3E-01	—	—	4E-01	4E-01	—	—	3E-01	—
Lithium	5E-02	—	2E-02	4E-02	—	5E-02	—	—	4E-02	—	—	4E-02	4E-02	—	—	5E-02	—
Manganese	3E-02	—	3E-02	4E-02	—	3E-02	—	—	2E-02	—	—	3E-02	4E-02	—	—	3E-02	—
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	5E-03	5E-03	—	—	—	—
Nickel	5E-03	—	4E-03	1E-02	—	7E-03	—	—	6E-03	—	—	7E-03	8E-03	—	—	6E-03	—
Nitrate	2E-05	—	5E-06	1E-05	—	—	2E-05	—	4E-05	—	—	2E-05	2E-05	—	—	1E-04	—
Nitrite	3E-05	—	3E-05	5E-05	—	1E-05	—	—	—	—	—	8E-05	6E-05	—	—	5E-05	—
Selenium	1E-03	—	2E-03	2E-03	—	2E-03	—	—	3E-03	—	—	3E-03	3E-03	—	—	3E-03	—
Silver	2E-04	—	1E-04	2E-04	—	2E-04	—	—	—	—	—	—	—	—	—	—	—
Strontium	5E-04	—	4E-04	7E-04	—	7E-04	—	—	4E-04	—	—	6E-04	8E-04	—	—	6E-04	—
Styrene	—	2E-08	—	—	2E-08	—	—	2E-08	—	2E-08	2E-08	—	—	3E-08	—	—	3E-08
Toluene	—	6E-08	—	—	9E-08	—	—	4E-08	—	5E-08	5E-08	—	—	2E-07	—	—	6E-08
Vanadium	1E-01	—	2E-01	2E-01	—	1E-01	—	—	6E-02	—	—	1E-01	1E-01	—	—	7E-02	—
Zinc	2E-03	—	2E-03	2E-03	—	2E-03	—	—	1E-03	—	—	2E-03	2E-03	—	—	2E-03	—
HI	1E+00	8E-08	1E+00	1E+00	1E-07	1E+00	9E-05	6E-08	1E+00	7E-08	8E-08	1E+00	1E+00	2E-07	1E-03	1E+00	9E-08
HI_{Sample} Depth	**1.2**		**1.5**	**1.4**		**1.3**			**1.0**		<0.01	**1.3**	**1.3**			**1.2**	

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-6. Non-Cancer Hazard Results for Exposure Area J.

Well Name	**C8100**			
Sample ID	**B2B1L6**	**B2B1L7**	**B2C1M2**	**B2C1M3**
Top (feet)	**0**	**0**	**5.7**	**15**
Bottom (feet)	**1**	**1**	**7.7**	**19**
COPC	**COPC-Specific Hazard Quotient**			
Aluminum	1E-01	—	9E-02	9E-02
Antimony	7E-03	—	7E-03	7E-02
Arsenic	1E-01	—	2E-01	3E-01
Barium	2E-02	—	5E-03	5E-03
Beryllium	2E-03	—	1E-03	8E-04
Bis(2-ethylhexyl) phthalate	—	—	—	1E-03
Boron	3E-03	—	4E-04	4E-04
Butylbenzylphthalate	—	—	—	5E-06
Cadmium	1E-03	—	1E-03	1E-03
Chromium	9E-05	—	1E-04	8E-05
Cobalt	3E-01	—	3E-01	3E-01
Copper	—	4E-03	4E-03	4E-03
Fluoride	1E-04	—	2E-04	3E-04
Iron	3E-01	—	4E-01	4E-01
Lithium	5E-02	—	5E-02	5E-02
Manganese	—	3E-02	3E-02	3E-02
Mercury	—	7E-04	—	5E-04
Nickel	9E-03	—	6E-03	7E-03
Nitrate	6E-06	—	2E-05	2E-05
Nitrite	—	6E-05	1E-04	5E-05
Silver	2E-04	—	1E-04	1E-04
Strontium	3E-03	—	7E-04	7E-04
Tin	6E-05	—	8E-05	—
Vanadium	1E-01	—	1E-01	1E-01
Zinc	1E-03	—	2E-03	2E-03
HI	1E+00	3E-02	1E+00	1E+00
HI_{Sample}Depth	**1.1**		**1.2**	**1.5**

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available. Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

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Table G-5-7. Non-Cancer Hazard Results for Exposure Area L1 + L2.

Well Name	C7466									C7670						
Sample ID	**B20XW6**	**B20XW8**	**B20XW9**	**B20XX1**	**B20XX2**	**B20XX4**	**B211X9**	**B215K8**	**B215K9**	**B238J9**	**B23KN7**	**B23KN9**	**B23R25**	**B23KP2**	**B25CN2**	**B23KP6**
Top (feet)	**5**	**5**	**10**	**10**	**14**	**14**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**10**	**10**	**14**
Bottom (feet)	**7**	**7**	**12**	**12**	**16**	**16**	**1**	**1**	**1**	**7**	**1**	**1**	**1**	**12**	**14**	**16**
COPC	**COPC-Specific Hazard Quotient**															
1-Butanol	—	—	—	—	—	—	—	—	—	—	—	3E-06	—	—	—	—
Acetone	—	—	—	—	—	—	—	—	—	—	—	—	—	6E-07	—	—
Aluminum	—	—	7E-02	—	6E-02	—	—	—	9E-02	7E-02	8E-02	—	—	—	7E-02	7E-02
Antimony	—	—	—	—	—	—	—	—	2E-02	3E-03	—	—	9E-03	—	3E-03	2E-03
Arsenic	2E-01	—	8E-02	—	8E-02	—	—	—	2E-01	9E-02	2E-01	—	—	—	1E-01	1E-01
Barium	7E-03	—	3E-03	—	3E-03	—	—	—	5E-03	4E-03	—	—	5E-03	—	3E-03	3E-03
Beryllium	—	—	—	—	—	—	—	—	—	9E-04	—	—	1E-03	—	7E-04	7E-04
beta-BHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bis(2-ethylhexyl) phthalate	1E-03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butylbenzylphthalate	—	—	—	—	3E-06	—	—	—	4E-06	—	—	—	—	—	—	—
Cadmium	1E-03	—	4E-04	—	8E-04	—	—	—	2E-03	8E-04	—	—	1E-03	—	9E-04	7E-04
Chromium	9E-05	—	6E-05	—	7E-05	—	—	—	7E-05	9E-05	6E-05	—	—	—	7E-05	7E-05
Cobalt	4E-01	—	2E-01	—	2E-01	—	—	3E-01	—	2E-01	4E-01	—	—	—	2E-01	2E-01
Copper	5E-03	—	3E-03	—	3E-03	—	—	—	4E-03	3E-03	—	—	4E-03	—	3E-03	3E-03
Fluoride	3E-04	—	1E-04	—	8E-05	—	—	1E-04	—	2E-04	3E-04	—	—	—	2E-04	2E-04
Iron	5E-01	—	2E-01	—	3E-01	—	—	—	4E-01	3E-01	4E-01	—	—	—	3E-01	3E-01
Lithium	5E-02	—	4E-02	—	3E-02	—	—	—	4E-02	4E-02	—	—	5E-02	—	4E-02	4E-02
Manganese	4E-02	—	2E-02	—	2E-02	—	—	—	4E-02	2E-02	—	—	3E-02	—	2E-02	2E-02
Mercury	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4E-04	7E-04
Molybdenum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6E-03	6E-03
Nickel	8E-03	—	5E-03	—	5E-03	—	—	—	1E-02	7E-03	7E-03	—	—	—	5E-03	5E-03
Nitrate	2E-05	—	6E-06	—	3E-06	—	—	—	1E-05	1E-05	—	—	7E-06	—	7E-06	6E-06
Nitrite	1E-04	—	2E-04	—	—	—	—	8E-05	—	1E-04	—	—	—	—	7E-05	5E-05
Selenium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3E-03	—
Silver	3E-04	—	1E-04	—	2E-04	—	—	—	2E-04	—	—	—	—	—	—	—
Strontium	7E-04	—	5E-04	—	4E-04	—	—	—	6E-04	6E-04	7E-04	—	—	—	5E-04	6E-04
Vanadium	2E-01	—	9E-02	—	1E-01	—	—	—	2E-01	8E-02	9E-02	—	—	—	8E-02	8E-02
Zinc	2E-03	—	1E-03	—	1E-03	—	—	—	2E-03	1E-03	2E-03	—	—	—	1E-03	1E-03
HI	1E+00	—	7E-01	—	9E-01	—	—	3E-01	9E-01	8E-01	1E+00	3E-06	1E-01	6E-07	8E-01	9E-01
$HI_{Sample Depth}$	**1.4**		0.7		0.9		**1.3**			0.8	**1.2**			<0.01	0.8	0.9

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-8. Non-Cancer Hazard Results for Exposure Area P.

Well Name	C6392		C6400				C6402					C6404	C6406					
Sample ID	**B1YT69**	**B1YT71**	**B1YTF8**	**B1YTF9**	**B1YTH1**	**B1YTH3**	**B20XV5**	**B20XV9**	**B20XW1**	**B20XW3**	**B20XW5**	**B1YT92**	**B1YTC7**	**B1YTC9**	**B1YTD0**	**B1YTD2**	**B1YTD3**	**B1YTD5**
Top (feet)	**14**	**14**	**10**	**5**	**5**	**10**	**6**	**10**	**10**	**14**	**14**	**6**	**5**	**5**	**10**	**10**	**14**	**14**
Bottom (feet)	**16**	**16**	**12**	**7**	**7**	**12**	**8**	**12**	**12**	**16**	**16**	**8**	**7**	**7**	**12**	**12**	**16**	**16**
COPC	**COPC-Specific Hazard Quotient**																	
Acetone	1E-07	—	2E-07	1E-07	—	—	—	—	6E-08	—	6E-08	—	2E-07	—	2E-07	—	—	—
Aluminum	—	1E-01	—	—	7E-02	7E-02	1E-01	9E-02	—	8E-02	—	7E-02	—	9E-02	—	9E-02	—	7E-02
Antimony	—	6E-03	—	—	—	—	5E-03	—	—	—	—	—	—	—	—	1E-02	—	—
Aroclor-1260	—	—	—	—	—	3E-98	—	3E-98	—	—	—	—	—	—	—	—	—	—
Arsenic	—	2E-01	—	—	2E-01	2E-01	2E-01	2E-01	—	2E-01	—	2E-01	—	2E-01	—	2E-01	—	7E-02
Barium	—	5E-03	—	—	4E-03	5E-03	5E-03	5E-03	—	4E-03	—	4E-03	—	5E-03	—	5E-03	—	5E-03
Beryllium	—	—	—	—	1E-03	—	2E-03	2E-03	—	1E-03	—	—	—	2E-03	—	2E-03	—	—
beta-BHC	—	—	—	—	3E-98	2E-98	2E-98	—	—	—	—	—	—	—	—	—	—	2E-98
Bis(2-ethylhexyl) phthalate	—	—	—	—	—	—	—	5E-04	—	—	—	1E-03	—	—	—	—	—	—
Cadmium	—	2E-03	—	—	1E-03	2E-03	2E-03	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03	—	1E-03
Chromium	—	7E-05	—	—	5E-05	4E-05	7E-05	8E-05	—	8E-05	—	6E-05	—	8E-05	—	9E-05	—	2E-04
Cobalt	—	4E-01	—	—	3E-01	3E-01	3E-01	4E-01	—	3E-01	—	3E-01	—	4E-01	—	4E-01	—	4E-01
Copper	—	4E-03	—	—	4E-03	4E-03	4E-03	4E-03	—	4E-03	—	4E-03	—	4E-03	—	4E-03	—	4E-03
Di-n-butylphthalate	—	—	—	—	—	—	—	—	—	—	—	1E-04	—	—	—	—	—	—
Fluoride	—	1E-03	—	—	4E-04	4E-04	—	4E-04	—	5E-04	—	5E-04	—	3E-04	—	4E-04	—	3E-04
Iron	—	4E-01	—	—	4E-01	4E-01	4E-01	4E-01	—	4E-01	—	4E-01	—	4E-01	—	4E-01	—	5E-01
Lithium	—	5E-02	—	—	4E-02	4E-02	6E-02	5E-02	—	5E-02	—	4E-02	—	5E-02	—	5E-02	—	3E-02
Manganese	—	3E-02	—	—	3E-02	3E-02	3E-02	3E-02	—	3E-02	—	3E-02	—	3E-02	—	3E-02	—	3E-02
Mercury	—	—	—	—	8E-04	—	—	—	—	—	—	—	—	—	—	—	—	—
Methylene chloride	—	—	—	—	—	—	—	—	—	—	—	—	2E-06	—	2E-06	—	5E-06	—
Nickel	—	8E-03	—	—	5E-03	6E-03	4E-03	4E-03	—	5E-03	—	6E-03	—	6E-03	—	8E-03	—	9E-03
Nitrate	—	2E-05	—	—	1E-05	1E-05	—	2E-05	—	3E-05	—	7E-06	—	2E-05	—	9E-06	—	1E-05
Nitrite	—	—	—	—	2E-04	2E-04	—	2E-04	—	2E-04	—	7E-05	—	2E-04	—	1E-04	—	1E-04
Silver	—	—	—	—	3E-04	3E-04	5E-04	5E-04	—	6E-04	—	4E-04	—	—	—	4E-04	—	—
Strontium	—	7E-04	—	—	6E-04	6E-04	6E-04	6E-04	—	6E-04	—	5E-04	—	8E-04	—	8E-04	—	6E-04
Tin	—	—	—	—	—	—	—	—	—	—	—	2E-04	—	2E-04	—	2E-04	—	3E-04
Toluene	5E-08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanadium	—	2E-01	—	—	1E-01	1E-01	2E-01	2E-01	—	2E-01	—	1E-01	—	2E-01	—	2E-01	—	3E-01
Zinc	—	2E-03	—	—	2E-03	1E-02	2E-03	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03	—	2E-03
HI	2E-07	1E+00	2E-07	1E-07	1E+00	1E+00	1E+00	1E+00	6E-08	1E+00	6E-08	1E+00	3E-06	1E+00	2E-06	1E+00	5E-06	1E+00
HI_{Sample} Depth	**1.4**		<0.01	**1.2**		**1.2**	**1.4**	**1.4**		**1.3**		**1.1**	**1.3**		**1.4**		**1.5**	

COPC = contaminant of potential concern HI = hazard index "—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-9. Non-Cancer Hazard Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
Top (feet)	**0**	**0**	**0**	**5**	**5**	**10**	**14**	**10**
Bottom (feet)	**1**	**1**	**1**	**7**	**7**	**12**	**16**	**14**
COPC	**COPC-Specific Hazard Quotient**							
2-Hexanone	—	6E-06	—	—	7E-06	5E-06	—	—
Acetone	—	—	—	—	—	4E-08	9E-08	—
Aluminum	—	—	1E-01	1E-01	—	—	—	8E-02
Antimony	—	—	8E-03	—	—	—	—	5E-03
Arsenic	—	—	2E-01	2E-01	—	—	—	2E-01
Barium	—	—	5E-03	5E-03	—	—	—	4E-03
Beryllium	—	—	1E-03	1E-03	—	—	—	1E-03
Butylbenzylphthalate	—	—	5E-06	7E-06	—	—	—	—
Cadmium	—	—	4E-02	4E-02	—	—	—	4E-02
Chromium	—	—	8E-05	9E-05	—	—	—	8E-05
Cobalt	—	—	4E-01	4E-01	—	—	—	3E-01
Copper	—	—	4E-03	5E-03	—	—	—	3E-03
Fluoride	—	—	2E-04	6E-04	—	—	—	7E-04
Iron	—	—	5E-01	5E-01	—	—	—	4E-01
Lithium	—	—	5E-02	6E-02	—	—	—	5E-02
Manganese	—	—	3E-02	4E-02	—	—	—	3E-02
Mercury	—	—	6E-04	—	—	—	—	—

Table G-5-9. Non-Cancer Hazard Results for Exposure Area R. (2 sheets)

Well Name	**C7668**							
Sample ID	**B23TK2**	**B23TK4**	**B23TK5**	**B23TK8**	**B23TL0**	**B23TL6**	**B23TM2**	**B27130**
COPC (continued)	**COPC-Specific Hazard Quotient (continued)**							
Methylene chloride	—	—	—	—	—	—	3E-06	—
Nickel	—	—	7E-03	7E-03	—	—	—	5E-03
Nitrate	—	—	1E-05	2E-05	—	—	—	7E-05
Nitrite	—	—	2E-04	2E-05	—	—	—	—
Selenium	2E-03	—	—	1E-03	—	—	—	2E-03
Silver	1E-04	—	—	1E-04	—	—	—	2E-04
Strontium	—	—	6E-04	8E-04	—	—	—	6E-04
Toluene	—	9E-08	—	—	5E-08	5E-08	—	—
Vanadium	—	—	2E-01	2E-01	—	—	—	1E-01
Zinc	—	—	2E-03	2E-03	—	—	—	2E-03
HI	2E-03	6E-06	2E+00	2E+00	7E-06	5E-06	3E-06	1E+00
HI_{Sample}Depth	**1.5**			**1.6**		<0.01	<0.01	**1.3**

COPC = contaminant of potential concern HI = hazard index

"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

Table G-5-10. Non-Cancer Hazard Results for Exposure Area U.

Well Name	**C7676**							
Sample ID	**B26CC1**	**B26CC4**	**B26CC5**	**B26CC7**	**B26JK6**	**B26JK7**	**B26JL7**	**B29612**
Top (feet)	**5**	**10**	**10**	**14**	**0**	**0**	**0**	**5**
Bottom (feet)	**7**	**12**	**12**	**16**	**1**	**1**	**1**	**9**
COPC	**COPC-Specific Hazard Quotient**							
Acetone	—	—	9E-08	8E-08	—	—	—	—
Aluminum	—	6E-02	—	—	9E-02	—	—	1E-01
Antimony	—	5E-03	—	—	7E-03	—	—	9E-03
Arsenic	—	1E-01	—	—	—	2E-01	—	3E-01
Barium	—	3E-03	—	—	6E-03	—	—	5E-03
Benzene	—	—	—	1E-06	—	—	—	—
Beryllium	—	8E-04	—	—	—	1E-03	—	1E-03
Boron	—	—	—	—	4E-04	—	—	—
Chromium	—	7E-05	—	—	6E-05	—	—	8E-05
Cobalt	—	2E-01	—	—	4E-01	—	—	4E-01
Copper	—	3E-03	—	—	—	4E-03	—	4E-03
Fluoride	—	4E-04	—	—	8E-05	—	—	4E-04
Iron	—	3E-01	—	—	4E-01	—	—	4E-01
Lithium	—	3E-02	—	—	—	5E-02	—	6E-02
Manganese	—	2E-02	—	—	3E-02	—	—	3E-02
Mercury	—	—	—	—	—	9E-04	—	4E-04
Molybdenum	—	—	—	—	6E-03	—	—	6E-03
Nickel	—	4E-03	—	—	5E-03	—	—	6E-03
Nitrate	—	1E-05	—	—	1E-05	—	—	1E-05
Nitrite	—	3E-05	—	—	—	4E-05	—	9E-05
Selenium	—	3E-03	—	—	—	3E-03	—	5E-03
Strontium	—	5E-04	—	—	—	1E-03	—	8E-04
Styrene	—	—	—	—	—	—	2E-08	—
Toluene	9E-08	—	9E-08	1E-07	—	—	1E-07	—
Vanadium	—	1E-01	—	—	1E-01	—	—	1E-01
Zinc	—	1E-03	—	—	2E-03	—	—	2E-03
HI	9E-08	9E-01	2E-07	1E-06	1E+00	2E-01	1E-07	1E+00
HI$_{\textbf{Sample}\text{Depth}}$	<0.01	0.9		<0.01	**1.2**			**1.4**

COPC = contaminant of potential concern HI = hazard index
"—" means either sample results are non-detect or no noncarcinogenic toxicity values are available.
Summing all hazard quotients for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.

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APPENDIX H

PROTECTION OF GROUNDWATER ASSESSMENT USING SAMPLE-BY-SAMPLE APPROACH

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Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 1 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8102	B2D1X6	65	67	Aluminum	µg/kg	6,740,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Antimony	µg/kg	132	5,424	No	130	Yes	No
A+B_Deep	C8102	B2D1X6	65	67	Arsenic	µg/kg	1,920	2,920	No	20,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Barium	µg/kg	57,900	1,648,000	No	132,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Cadmium	µg/kg	84.1	690	No	563	No	No
A+B_Deep	C8102	B2D1X6	65	67	Chloride	µg/kg	855	—	ND	100,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Chromium	µg/kg	26,100	480,096,000	No	18,500	Yes	No
A+B_Deep	C8102	B2D1X6	65	67	Cobalt	µg/kg	6,610	4,339	Yes	15,700	No	No
A+B_Deep	C8102	B2D1X6	65	67	Copper	µg/kg	10,100	284,160	No	22,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Fluoride	µg/kg	580	2,883,840	No	2,810	No	No
A+B_Deep	C8102	B2D1X6	65	67	Hexavalent Chromium	µg/kg	26,100	192	Yes	18,500	Yes	Yes
A+B_Deep	C8102	B2D1X6	65	67	Iron	µg/kg	18,500,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Lead	µg/kg	3,590	3,000,060	No	10,200	No	No
A+B_Deep	C8102	B2D1X6	65	67	Lithium	µg/kg	8,950	192,128	No	13,300	No	No
A+B_Deep	C8102	B2D1X6	65	67	Manganese	µg/kg	277,000	500,736	No	512,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Nickel	µg/kg	16,900	130,400	No	19,100	No	No
A+B_Deep	C8102	B2D1X6	65	67	Nitrate	µg/kg	5,010	—	ND	52,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Nitrite	µg/kg	303	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X6	65	67	Phosphorus	µg/kg	626,000	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X6	65	67	Silver	µg/kg	45.7	13,600	No	167	No	No
A+B_Deep	C8102	B2D1X6	65	67	Strontium	µg/kg	30,900	6,758,400	No	—	ND	No
A+B_Deep	C8102	B2D1X6	65	67	Sulfate	µg/kg	15,500	—	ND	237,000	No	No
A+B_Deep	C8102	B2D1X6	65	67	Thallium	µg/kg	112	712	No	185	No	No
A+B_Deep	C8102	B2D1X6	65	67	Vanadium	µg/kg	43,500	1,600,320	No	85,100	No	No
A+B_Deep	C8102	B2D1X6	65	67	Zinc	µg/kg	34,900	5,971,200	No	67,800	No	No
A+B_Deep	C8102	B2D1X7	96	98	Aluminum	µg/kg	7,530,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Antimony	µg/kg	213	5,424	No	130	Yes	No
A+B_Deep	C8102	B2D1X7	96	98	Arsenic	µg/kg	1,930	2,920	No	20,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Barium	µg/kg	74,800	1,648,000	No	132,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Cadmium	µg/kg	78.8	690	No	563	No	No
A+B_Deep	C8102	B2D1X7	96	98	Chloride	µg/kg	878	—	ND	100,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Chromium	µg/kg	20,200	480,096,000	No	18,500	Yes	No
A+B_Deep	C8102	B2D1X7	96	98	Cobalt	µg/kg	5,670	4,339	Yes	15,700	No	No
A+B_Deep	C8102	B2D1X7	96	98	Copper	µg/kg	9,680	284,160	No	22,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Fluoride	µg/kg	712	2,883,840	No	2,810	No	No
A+B_Deep	C8102	B2D1X7	96	98	Hexavalent Chromium	µg/kg	20,200	192	Yes	18,500	Yes	Yes
A+B_Deep	C8102	B2D1X7	96	98	Iron	µg/kg	16,700,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Lead	µg/kg	4,250	3,000,060	No	10,200	No	No
A+B_Deep	C8102	B2D1X7	96	98	Lithium	µg/kg	10,500	192,128	No	13,300	No	No
A+B_Deep	C8102	B2D1X7	96	98	Manganese	µg/kg	292,000	500,736	No	512,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Nickel	µg/kg	16,500	130,400	No	19,100	No	No
A+B_Deep	C8102	B2D1X7	96	98	Nitrate	µg/kg	7,670	—	ND	52,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 2 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8102	B2D1X7	96	98	Nitrite	µg/kg	524	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X7	96	98	Phosphorus	µg/kg	521,000	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X7	96	98	Silver	µg/kg	48.6	13,600	No	167	No	No
A+B_Deep	C8102	B2D1X7	96	98	Strontium	µg/kg	37,500	6,758,400	No	—	ND	No
A+B_Deep	C8102	B2D1X7	96	98	Sulfate	µg/kg	16,100	—	ND	237,000	No	No
A+B_Deep	C8102	B2D1X7	96	98	Thallium	µg/kg	137	712	No	185	No	No
A+B_Deep	C8102	B2D1X7	96	98	Vanadium	µg/kg	34,400	1,600,320	No	85,100	No	No
A+B_Deep	C8102	B2D1X7	96	98	Zinc	µg/kg	34,100	5,971,200	No	67,800	No	No
A+B_Deep	C8102	B2D1X8	155	157	Aluminum	µg/kg	6,400,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Antimony	µg/kg	265	5,424	No	130	Yes	No
A+B_Deep	C8102	B2D1X8	155	157	Arsenic	µg/kg	1,910	2,920	No	20,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Barium	µg/kg	62,000	1,648,000	No	132,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Cadmium	µg/kg	112	690	No	563	No	No
A+B_Deep	C8102	B2D1X8	155	157	Chloride	µg/kg	1,150	—	ND	100,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Chromium	µg/kg	18,100	480,096,000	No	18,500	No	No
A+B_Deep	C8102	B2D1X8	155	157	Cobalt	µg/kg	5,730	4,339	Yes	15,700	No	No
A+B_Deep	C8102	B2D1X8	155	157	Copper	µg/kg	10,100	284,160	No	22,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Fluoride	µg/kg	797	2,883,840	No	2,810	No	No
A+B_Deep	C8102	B2D1X8	155	157	Hexavalent Chromium	µg/kg	18,100	192	Yes	18,500	No	No
A+B_Deep	C8102	B2D1X8	155	157	Iron	µg/kg	15,400,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Lead	µg/kg	3,950	3,000,060	No	10,200	No	No
A+B_Deep	C8102	B2D1X8	155	157	Lithium	µg/kg	8,950	192,128	No	13,300	No	No
A+B_Deep	C8102	B2D1X8	155	157	Manganese	µg/kg	255,000	500,736	No	512,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Nickel	µg/kg	15,100	130,400	No	19,100	No	No
A+B_Deep	C8102	B2D1X8	155	157	Nitrate	µg/kg	4,720	—	ND	52,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Nitrite	µg/kg	389	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X8	155	157	Phosphorus	µg/kg	544,000	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X8	155	157	Silver	µg/kg	40.2	13,600	No	167	No	No
A+B_Deep	C8102	B2D1X8	155	157	Strontium	µg/kg	34,700	6,758,400	No	—	ND	No
A+B_Deep	C8102	B2D1X8	155	157	Sulfate	µg/kg	22,400	—	ND	237,000	No	No
A+B_Deep	C8102	B2D1X8	155	157	Thallium	µg/kg	120	712	No	185	No	No
A+B_Deep	C8102	B2D1X8	155	157	Vanadium	µg/kg	32,800	1,600,320	No	85,100	No	No
A+B_Deep	C8102	B2D1X8	155	157	Zinc	µg/kg	34,700	5,971,200	No	67,800	No	No
A+B_Deep	C8102	B2D1X9	188	190	Aluminum	µg/kg	6,130,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Antimony	µg/kg	156	5,424	No	130	Yes	No
A+B_Deep	C8102	B2D1X9	188	190	Arsenic	µg/kg	2,150	2,920	No	20,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Barium	µg/kg	58,300	1,648,000	No	132,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Cadmium	µg/kg	66.3	690	No	563	No	No
A+B_Deep	C8102	B2D1X9	188	190	Chloride	µg/kg	6,030	—	ND	100,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Chromium	µg/kg	14,500	480,096,000	No	18,500	No	No
A+B_Deep	C8102	B2D1X9	188	190	Cobalt	µg/kg	5,270	4,339	Yes	15,700	No	No
A+B_Deep	C8102	B2D1X9	188	190	Copper	µg/kg	9,740	284,160	No	22,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 3 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8102	B2D1X9	188	190	Fluoride	µg/kg	397	2,883,840	No	2,810	No	No
A+B_Deep	C8102	B2D1X9	188	190	Hexavalent Chromium	µg/kg	14,500	192	Yes	18,500	No	No
A+B_Deep	C8102	B2D1X9	188	190	Iron	µg/kg	16,500,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Lead	µg/kg	3,900	3,000,060	No	10,200	No	No
A+B_Deep	C8102	B2D1X9	188	190	Lithium	µg/kg	9,090	192,128	No	13,300	No	No
A+B_Deep	C8102	B2D1X9	188	190	Manganese	µg/kg	247,000	500,736	No	512,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Nickel	µg/kg	13,400	130,400	No	19,100	No	No
A+B_Deep	C8102	B2D1X9	188	190	Nitrate	µg/kg	5,540	—	ND	52,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Phosphorus	µg/kg	559,000	—	ND	—	ND	No
A+B_Deep	C8102	B2D1X9	188	190	Silver	µg/kg	40.3	13,600	No	167	No	No
A+B_Deep	C8102	B2D1X9	188	190	Strontium	µg/kg	28,100	6,758,400	No	—	ND	No
A+B_Deep	C8102	B2D1X9	188	190	Sulfate	µg/kg	53,300	—	ND	237,000	No	No
A+B_Deep	C8102	B2D1X9	188	190	Thallium	µg/kg	97.3	712	No	185	No	No
A+B_Deep	C8102	B2D1X9	188	190	Vanadium	µg/kg	38,800	1,600,320	No	85,100	No	No
A+B_Deep	C8102	B2D1X9	188	190	Zinc	µg/kg	32,900	5,971,200	No	67,800	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Aluminum	µg/kg	5,940,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Antimony	µg/kg	108	5,424	No	130	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Arsenic	µg/kg	1,720	2,920	No	20,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Barium	µg/kg	79,900	1,648,000	No	132,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Cadmium	µg/kg	69.1	690	No	563	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Chloride	µg/kg	5,920	—	ND	100,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Chromium	µg/kg	17,600	480,096,000	No	18,500	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Cobalt	µg/kg	6,000	4,339	Yes	15,700	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Copper	µg/kg	11,000	284,160	No	22,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Fluoride	µg/kg	641	2,883,840	No	2,810	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Hexavalent Chromium	µg/kg	17,600	192	Yes	18,500	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Iron	µg/kg	17,200,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Lead	µg/kg	3,190	3,000,060	No	10,200	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Lithium	µg/kg	7,130	192,128	No	13,300	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Manganese	µg/kg	256,000	500,736	No	512,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Nickel	µg/kg	17,800	130,400	No	19,100	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Nitrate	µg/kg	7,610	—	ND	52,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Nitrite	µg/kg	357	—	ND	—	ND	No
A+B_Deep	C8102	B2D1Y0	221	223	Phosphorus	µg/kg	691,000	—	ND	—	ND	No
A+B_Deep	C8102	B2D1Y0	221	223	Strontium	µg/kg	29,700	6,758,400	No	—	ND	No
A+B_Deep	C8102	B2D1Y0	221	223	Sulfate	µg/kg	79,300	—	ND	237,000	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Thallium	µg/kg	99	712	No	185	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Vanadium	µg/kg	42,400	1,600,320	No	85,100	No	No
A+B_Deep	C8102	B2D1Y0	221	223	Zinc	µg/kg	30,900	5,971,200	No	67,800	No	No
A+B_Deep	C8104	B2FB31	41	43	Aluminum	µg/kg	10,300,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Antimony	µg/kg	211	5,424	No	130	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Arsenic	µg/kg	2,820	2,920	No	20,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 4 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8104	B2FB31	41	43	Barium	µg/kg	92,400	1,648,000	No	132,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Beryllium	µg/kg	231	63,216	No	1,510	No	No
A+B_Deep	C8104	B2FB31	41	43	Cadmium	µg/kg	67.6	690	No	563	No	No
A+B_Deep	C8104	B2FB31	41	43	Chloride	µg/kg	69,000	—	ND	100,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Chromium	µg/kg	19,900	480,096,000	No	18,500	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Cobalt	µg/kg	7,160	4,339	Yes	15,700	No	No
A+B_Deep	C8104	B2FB31	41	43	Copper	µg/kg	14,100	284,160	No	22,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Hexavalent Chromium	µg/kg	19,900	192	Yes	18,500	Yes	Yes
A+B_Deep	C8104	B2FB31	41	43	Iron	µg/kg	22,400,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Lead	µg/kg	11,900	3,000,060	No	10,200	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Lithium	µg/kg	8,070	192,128	No	13,300	No	No
A+B_Deep	C8104	B2FB31	41	43	Manganese	µg/kg	316,000	500,736	No	512,000	No	No
A+B_Deep	C8104	B2FB31	41	43	Mercury	µg/kg	23	2,090	No	13.1	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Nickel	µg/kg	15,700	130,400	No	19,100	No	No
A+B_Deep	C8104	B2FB31	41	43	Nitrate	µg/kg	57,500	—	ND	52,000	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Phosphorus	µg/kg	852,000	—	ND	—	ND	No
A+B_Deep	C8104	B2FB31	41	43	Silver	µg/kg	76.9	13,600	No	167	No	No
A+B_Deep	C8104	B2FB31	41	43	Strontium	µg/kg	67,700	6,758,400	No	—	ND	No
A+B_Deep	C8104	B2FB31	41	43	Sulfate	µg/kg	366,000	—	ND	237,000	Yes	No
A+B_Deep	C8104	B2FB31	41	43	Thallium	µg/kg	139	712	No	185	No	No
A+B_Deep	C8104	B2FB31	41	43	Vanadium	µg/kg	57,700	1,600,320	No	85,100	No	No
A+B_Deep	C8104	B2FB31	41	43	Zinc	µg/kg	44,300	5,971,200	No	67,800	No	No
A+B_Deep	C8104	B2FB32	93	95	Aluminum	µg/kg	6,350,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Antimony	µg/kg	163	5,424	No	130	Yes	No
A+B_Deep	C8104	B2FB32	93	95	Arsenic	µg/kg	3,870	2,920	Yes	20,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Barium	µg/kg	61,000	1,648,000	No	132,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Cadmium	µg/kg	57.2	690	No	563	No	No
A+B_Deep	C8104	B2FB32	93	95	Chloride	µg/kg	5,020	—	ND	100,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Chromium	µg/kg	27,700	480,096,000	No	18,500	Yes	No
A+B_Deep	C8104	B2FB32	93	95	Cobalt	µg/kg	5,560	4,339	Yes	15,700	No	No
A+B_Deep	C8104	B2FB32	93	95	Copper	µg/kg	10,700	284,160	No	22,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Diethylphthalate	µg/kg	240	72,192	No	—	ND	No
A+B_Deep	C8104	B2FB32	93	95	Hexavalent Chromium	µg/kg	27,700	192	Yes	18,500	Yes	Yes
A+B_Deep	C8104	B2FB32	93	95	Iron	µg/kg	16,600,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Lead	µg/kg	3,760	3,000,060	No	10,200	No	No
A+B_Deep	C8104	B2FB32	93	95	Lithium	µg/kg	9,210	192,128	No	13,300	No	No
A+B_Deep	C8104	B2FB32	93	95	Manganese	µg/kg	302,000	500,736	No	512,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Nickel	µg/kg	18,000	130,400	No	19,100	No	No
A+B_Deep	C8104	B2FB32	93	95	Nitrate	µg/kg	5,090	—	ND	52,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Phosphorus	µg/kg	518,000	—	ND	—	ND	No
A+B_Deep	C8104	B2FB32	93	95	Silver	µg/kg	43.4	13,600	No	167	No	No
A+B_Deep	C8104	B2FB32	93	95	Strontium	µg/kg	29,400	6,758,400	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 5 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8104	B2FB32	93	95	Sulfate	µg/kg	17,800	—	ND	237,000	No	No
A+B_Deep	C8104	B2FB32	93	95	Thallium	µg/kg	133	712	No	185	No	No
A+B_Deep	C8104	B2FB32	93	95	Vanadium	µg/kg	32,900	1,600,320	No	85,100	No	No
A+B_Deep	C8104	B2FB32	93	95	Zinc	µg/kg	30,700	5,971,200	No	67,800	No	No
A+B_Deep	C8104	B2FB33	117	119	Aluminum	µg/kg	6,890,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Antimony	µg/kg	196	5,424	No	130	Yes	No
A+B_Deep	C8104	B2FB33	117	119	Arsenic	µg/kg	3,710	2,920	Yes	20,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Barium	µg/kg	57,800	1,648,000	No	132,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Cadmium	µg/kg	47.6	690	No	563	No	No
A+B_Deep	C8104	B2FB33	117	119	Chloride	µg/kg	6,980	—	ND	100,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Chromium	µg/kg	13,100	480,096,000	No	18,500	No	No
A+B_Deep	C8104	B2FB33	117	119	Cobalt	µg/kg	3,290	4,339	No	15,700	No	No
A+B_Deep	C8104	B2FB33	117	119	Copper	µg/kg	9,560	284,160	No	22,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Hexavalent Chromium	µg/kg	13,100	192	Yes	18,500	No	No
A+B_Deep	C8104	B2FB33	117	119	Iron	µg/kg	15,200,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Lead	µg/kg	3,990	3,000,060	No	10,200	No	No
A+B_Deep	C8104	B2FB33	117	119	Lithium	µg/kg	9,620	192,128	No	13,300	No	No
A+B_Deep	C8104	B2FB33	117	119	Manganese	µg/kg	252,000	500,736	No	512,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Nickel	µg/kg	15,700	130,400	No	19,100	No	No
A+B_Deep	C8104	B2FB33	117	119	Nitrate	µg/kg	17,000	—	ND	52,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Phosphorus	µg/kg	465,000	—	ND	—	ND	No
A+B_Deep	C8104	B2FB33	117	119	Silver	µg/kg	39.4	13,600	No	167	No	No
A+B_Deep	C8104	B2FB33	117	119	Strontium	µg/kg	30,200	6,758,400	No	—	ND	No
A+B_Deep	C8104	B2FB33	117	119	Sulfate	µg/kg	32,500	—	ND	237,000	No	No
A+B_Deep	C8104	B2FB33	117	119	Thallium	µg/kg	136	712	No	185	No	No
A+B_Deep	C8104	B2FB33	117	119	Vanadium	µg/kg	29,200	1,600,320	No	85,100	No	No
A+B_Deep	C8104	B2FB33	117	119	Zinc	µg/kg	31,900	5,971,200	No	67,800	No	No
A+B_Deep	C8104	B2FB34	157	159	Aluminum	µg/kg	7,450,000	480,064,000	No	11,800,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Antimony	µg/kg	208	5,424	No	130	Yes	No
A+B_Deep	C8104	B2FB34	157	159	Arsenic	µg/kg	3,060	2,920	Yes	20,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Barium	µg/kg	72,900	1,648,000	No	132,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Cadmium	µg/kg	37.5	690	No	563	No	No
A+B_Deep	C8104	B2FB34	157	159	Chloride	µg/kg	14,300	—	ND	100,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Chromium	µg/kg	26,400	480,096,000	No	18,500	Yes	No
A+B_Deep	C8104	B2FB34	157	159	Cobalt	µg/kg	4,800	4,339	Yes	15,700	No	No
A+B_Deep	C8104	B2FB34	157	159	Copper	µg/kg	8,950	284,160	No	22,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Hexavalent Chromium	µg/kg	26,400	192	Yes	18,500	Yes	Yes
A+B_Deep	C8104	B2FB34	157	159	Iron	µg/kg	15,900,000	5,644,800	Yes	32,600,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Lead	µg/kg	3,310	3,000,060	No	10,200	No	No
A+B_Deep	C8104	B2FB34	157	159	Lithium	µg/kg	10,200	192,128	No	13,300	No	No
A+B_Deep	C8104	B2FB34	157	159	Manganese	µg/kg	271,000	500,736	No	512,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Nickel	µg/kg	18,200	130,400	No	19,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 6 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Deep	C8104	B2FB34	157	159	Nitrate	µg/kg	121,000	—	ND	52,000	Yes	No
A+B_Deep	C8104	B2FB34	157	159	Phosphorus	µg/kg	457,000	—	ND	—	ND	No
A+B_Deep	C8104	B2FB34	157	159	Silver	µg/kg	33.3	13,600	No	167	No	No
A+B_Deep	C8104	B2FB34	157	159	Strontium	µg/kg	35,000	6,758,400	No	—	ND	No
A+B_Deep	C8104	B2FB34	157	159	Sulfate	µg/kg	82,900	—	ND	237,000	No	No
A+B_Deep	C8104	B2FB34	157	159	Thallium	µg/kg	134	712	No	185	No	No
A+B_Deep	C8104	B2FB34	157	159	Vanadium	µg/kg	32,900	1,600,320	No	85,100	No	No
A+B_Deep	C8104	B2FB34	157	159	Zinc	µg/kg	33,000	5,971,200	No	67,800	No	No
A+B_Shallow	C8102	B2B1L8	0	1	Chloride	µg/kg	1,100	—	ND	100,000	No	No
A+B_Shallow	C8102	B2B1L8	0	1	Copper	µg/kg	11,500	284,160	No	22,000	No	No
A+B_Shallow	C8102	B2B1L8	0	1	Nickel	µg/kg	10,300	130,400	No	19,100	No	No
A+B_Shallow	C8102	B2B1L8	0	1	Thallium	µg/kg	117	712	No	185	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Aluminum	µg/kg	7,360,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Antimony	µg/kg	211	5,424	No	130	Yes	No
A+B_Shallow	C8102	B2B1L9	0	1	Aroclor-1254	µg/kg	6.46	1,144	No	—	ND	No
A+B_Shallow	C8102	B2B1L9	0	1	Arsenic	µg/kg	2,400	2,920	No	20,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Barium	µg/kg	100,000	1,648,000	No	132,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Cadmium	µg/kg	117	690	No	563	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Chromium	µg/kg	7,840	480,096,000	No	18,500	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Cobalt	µg/kg	8,380	4,339	Yes	15,700	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Fluoride	µg/kg	717	2,883,840	No	2,810	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Hexavalent Chromium	µg/kg	7,840	192	Yes	18,500	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Iron	µg/kg	23,000,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Lead	µg/kg	7,210	3,000,060	No	10,200	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Lithium	µg/kg	7,820	192,128	No	13,300	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Manganese	µg/kg	324,000	500,736	No	512,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Nitrate	µg/kg	3,900	—	ND	52,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Nitrite	µg/kg	1,080	—	ND	—	ND	No
A+B_Shallow	C8102	B2B1L9	0	1	Phosphorus	µg/kg	907,000	—	ND	—	ND	No
A+B_Shallow	C8102	B2B1L9	0	1	Silver	µg/kg	52.5	13,600	No	167	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Strontium	µg/kg	45,000	6,758,400	No	—	ND	No
A+B_Shallow	C8102	B2B1L9	0	1	Sulfate	µg/kg	3,890	—	ND	237,000	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Tin	µg/kg	6,900	48,038,400	No	—	ND	No
A+B_Shallow	C8102	B2B1L9	0	1	Vanadium	µg/kg	58,200	1,600,320	No	85,100	No	No
A+B_Shallow	C8102	B2B1L9	0	1	Zinc	µg/kg	44,500	5,971,200	No	67,800	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Aluminum	µg/kg	7,480,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Antimony	µg/kg	231	5,424	No	130	Yes	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Arsenic	µg/kg	3,320	2,920	Yes	20,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Barium	µg/kg	78,800	1,648,000	No	132,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Cadmium	µg/kg	105	690	No	563	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Chloride	µg/kg	4,880	—	ND	100,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Chromium	µg/kg	7,440	480,096,000	No	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 7 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Cobalt	µg/kg	6,540	4,339	Yes	15,700	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Copper	µg/kg	11,100	284,160	No	22,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Fluoride	µg/kg	2,750	2,883,840	No	2,810	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Hexavalent Chromium	µg/kg	7,440	192	Yes	18,500	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Iron	µg/kg	21,200,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Lead	µg/kg	5,810	3,000,060	No	10,200	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Lithium	µg/kg	8,540	192,128	No	13,300	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Manganese	µg/kg	331,000	500,736	No	512,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Nickel	µg/kg	7,530	130,400	No	19,100	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Nitrate	µg/kg	16,100	—	ND	52,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Nitrite	µg/kg	848	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Phosphorus	µg/kg	834,000	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Silver	µg/kg	45.1	13,600	No	167	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Strontium	µg/kg	34,400	6,758,400	No	—	ND	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Sulfate	µg/kg	11,900	—	ND	237,000	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Thallium	µg/kg	131	712	No	185	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Vanadium	µg/kg	48,300	1,600,320	No	85,100	No	No
A+B_Shallow	C8102	B2D1X2	5.7	9.7	Zinc	µg/kg	41,200	5,971,200	No	67,800	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Aluminum	µg/kg	6,710,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Antimony	µg/kg	252	5,424	No	130	Yes	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Arsenic	µg/kg	2,880	2,920	No	20,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Barium	µg/kg	66,100	1,648,000	No	132,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Cadmium	µg/kg	82.4	690	No	563	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Chloride	µg/kg	1,170	—	ND	100,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Chromium	µg/kg	8,440	480,096,000	No	18,500	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Cobalt	µg/kg	6,470	4,339	Yes	15,700	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Copper	µg/kg	10,800	284,160	No	22,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Di-n-octylphthalate	µg/kg	109	266,240,641	No	—	ND	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Fluoride	µg/kg	943	2,883,840	No	2,810	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Hexavalent Chromium	µg/kg	8,440	192	Yes	18,500	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Iron	µg/kg	22,500,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Lead	µg/kg	4,650	3,000,060	No	10,200	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Lithium	µg/kg	7,640	192,128	No	13,300	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Manganese	µg/kg	319,000	500,736	No	512,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Nickel	µg/kg	12,200	130,400	No	19,100	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Nitrate	µg/kg	4,640	—	ND	52,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Nitrite	µg/kg	342	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Phosphorus	µg/kg	834,000	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Silver	µg/kg	46.4	13,600	No	167	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Strontium	µg/kg	31,400	6,758,400	No	—	ND	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Sulfate	µg/kg	4,210	—	ND	237,000	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Thallium	µg/kg	121	712	No	185	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 8 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Tin	µg/kg	11,600	48,038,400	No	—	ND	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Vanadium	µg/kg	55,700	1,600,320	No	85,100	No	No
A+B_Shallow	C8102	B2D1X4	11.5	15.5	Zinc	µg/kg	41,400	5,971,200	No	67,800	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Aluminum	µg/kg	6,980,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Antimony	µg/kg	269	5,424	No	130	Yes	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Arsenic	µg/kg	3,170	2,920	Yes	20,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Barium	µg/kg	80,300	1,648,000	No	132,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Cadmium	µg/kg	96.6	690	No	563	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Chloride	µg/kg	829	—	ND	100,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Chromium	µg/kg	5,970	480,096,000	No	18,500	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Cobalt	µg/kg	9,200	4,339	Yes	15,700	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Copper	µg/kg	12,800	284,160	No	22,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Fluoride	µg/kg	2,050	2,883,840	No	2,810	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Hexavalent Chromium	µg/kg	5,970	192	Yes	18,500	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Iron	µg/kg	26,200,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Lead	µg/kg	4,970	3,000,060	No	10,200	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Lithium	µg/kg	7,100	192,128	No	13,300	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Manganese	µg/kg	377,000	500,736	No	512,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Nickel	µg/kg	8,280	130,400	No	19,100	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Nitrate	µg/kg	8,830	—	ND	52,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Nitrite	µg/kg	361	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Phosphorus	µg/kg	1,020,000	—	ND	—	ND	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Silver	µg/kg	52.5	13,600	No	167	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Strontium	µg/kg	30,100	6,758,400	No	—	ND	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Sulfate	µg/kg	11,300	—	ND	237,000	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Thallium	µg/kg	123	712	No	185	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Tin	µg/kg	9,790	48,038,400	No	—	ND	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Vanadium	µg/kg	66,500	1,600,320	No	85,100	No	No
A+B_Shallow	C8102	B2D1X5	16.1	18.1	Zinc	µg/kg	47,500	5,971,200	No	67,800	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Aluminum	µg/kg	7,100,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Antimony	µg/kg	123	5,424	No	130	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Arsenic	µg/kg	2,430	2,920	No	20,000	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Barium	µg/kg	70,200	1,648,000	No	132,000	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Cadmium	µg/kg	39.3	690	No	563	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Chromium	µg/kg	7,830	480,096,000	No	18,500	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Cobalt	µg/kg	6,910	4,339	Yes	15,700	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Copper	µg/kg	12,500	284,160	No	22,000	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Hexavalent Chromium	µg/kg	7,830	192	Yes	18,500	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Iron	µg/kg	22,800,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Lead	µg/kg	3,340	3,000,060	No	10,200	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Lithium	µg/kg	7,760	192,128	No	13,300	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Manganese	µg/kg	321,000	500,736	No	512,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 9 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Shallow	C8104	B2FB27	5.7	7.7	Nickel	µg/kg	9,520	130,400	No	19,100	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Phosphorus	µg/kg	876,000	—	ND	—	ND	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Silver	µg/kg	31.5	13,600	No	167	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Strontium	µg/kg	32,200	6,758,400	No	—	ND	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Thallium	µg/kg	122	712	No	185	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Vanadium	µg/kg	55,000	1,600,320	No	85,100	No	No
A+B_Shallow	C8104	B2FB27	5.7	7.7	Zinc	µg/kg	42,100	5,971,200	No	67,800	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Aluminum	µg/kg	6,910,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Antimony	µg/kg	114	5,424	No	130	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Arsenic	µg/kg	2,780	2,920	No	20,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Barium	µg/kg	72,900	1,648,000	No	132,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Cadmium	µg/kg	44	690	No	563	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Chromium	µg/kg	10,100	480,096,000	No	18,500	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Cobalt	µg/kg	7,100	4,339	Yes	15,700	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Copper	µg/kg	11,400	284,160	No	22,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Di-n-octylphthalate	µg/kg	300	266,240,641	No	—	ND	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Hexavalent Chromium	µg/kg	10,100	192	Yes	18,500	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Iron	µg/kg	21,300,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Lead	µg/kg	3,200	3,000,060	No	10,200	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Lithium	µg/kg	8,250	192,128	No	13,300	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Manganese	µg/kg	299,000	500,736	No	512,000	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Nickel	µg/kg	8,220	130,400	No	19,100	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Phosphorus	µg/kg	752,000	—	ND	—	ND	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Silver	µg/kg	28.6	13,600	No	167	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Strontium	µg/kg	30,100	6,758,400	No	—	ND	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Thallium	µg/kg	118	712	No	185	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Vanadium	µg/kg	51,800	1,600,320	No	85,100	No	No
A+B_Shallow	C8104	B2FB29	11.5	15.5	Zinc	µg/kg	41,600	5,971,200	No	67,800	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Aluminum	µg/kg	7,860,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Antimony	µg/kg	168	5,424	No	130	Yes	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Arsenic	µg/kg	2,590	2,920	No	20,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Barium	µg/kg	75,800	1,648,000	No	132,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Cadmium	µg/kg	42	690	No	563	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Chloride	µg/kg	5,650	—	ND	100,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Chromium	µg/kg	11,100	480,096,000	No	18,500	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Cobalt	µg/kg	6,650	4,339	Yes	15,700	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Copper	µg/kg	11,800	284,160	No	22,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Hexavalent Chromium	µg/kg	11,100	192	Yes	18,500	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Iron	µg/kg	23,600,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Lead	µg/kg	2,920	3,000,060	No	10,200	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Lithium	µg/kg	8,640	192,128	No	13,300	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Manganese	µg/kg	346,000	500,736	No	512,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 10 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
A+B_Shallow	C8104	B2FB30	16.1	18.1	Nickel	µg/kg	11,800	130,400	No	19,100	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Nitrate	µg/kg	5,270	—	ND	52,000	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Phosphorus	µg/kg	791,000	—	ND	—	ND	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Silver	µg/kg	29.2	13,600	No	167	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Strontium	µg/kg	35,000	6,758,400	No	—	ND	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Sulfate	µg/kg	592,000	—	ND	237,000	Yes	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Thallium	µg/kg	122	712	No	185	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Vanadium	µg/kg	58,900	1,600,320	No	85,100	No	No
A+B_Shallow	C8104	B2FB30	16.1	18.1	Zinc	µg/kg	46,900	5,971,200	No	67,800	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Aluminum	µg/kg	7,770,000	480,064,000	No	11,800,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Antimony	µg/kg	342	5,424	No	130	Yes	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Aroclor-1254	µg/kg	8.59	1,144	No	—	ND	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Arsenic	µg/kg	5,220	2,920	Yes	20,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Barium	µg/kg	81,100	1,648,000	No	132,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Chromium	µg/kg	8,990	480,096,000	No	18,500	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Cobalt	µg/kg	11,400	4,339	Yes	15,700	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Copper	µg/kg	14,200	284,160	No	22,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Diethylphthalate	µg/kg	340	72,192	No	—	ND	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Hexavalent Chromium	µg/kg	8,990	192	Yes	18,500	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Iron	µg/kg	23,600,000	5,644,800	Yes	32,600,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Lead	µg/kg	5,640	3,000,060	No	10,200	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Manganese	µg/kg	371,000	500,736	No	512,000	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Nickel	µg/kg	9,840	130,400	No	19,100	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Silver	µg/kg	46.1	13,600	No	167	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Strontium	µg/kg	37,200	6,758,400	No	—	ND	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Thallium	µg/kg	137	712	No	185	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Zinc	µg/kg	45,600	5,971,200	No	67,800	No	No
A+B_Shallow	C8104	B2FPF1	0.5	1	Nitrate	µg/kg	1,710	—	ND	52,000	No	No
A+B_Shallow	C8104	B2FPF2	0.5	1	Cadmium	µg/kg	83.4	690	No	563	No	No
A+B_Shallow	C8104	B2FPF2	0.5	1	Lithium	µg/kg	8,170	192,128	No	13,300	No	No
A+B_Shallow	C8104	B2FPF2	0.5	1	Phosphorus	µg/kg	873,000	—	ND	—	ND	No
A+B_Shallow	C8104	B2FPF2	0.5	1	Vanadium	µg/kg	56,700	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM5	27	29	Aluminum	µg/kg	7,560,000	480,064,000	No	11,800,000	No	No
C_Deep	C8106	B2FYM5	27	29	Antimony	µg/kg	224	5,424	No	130	Yes	No
C_Deep	C8106	B2FYM5	27	29	Arsenic	µg/kg	3,710	2,920	Yes	20,000	No	No
C_Deep	C8106	B2FYM5	27	29	Barium	µg/kg	79,900	1,648,000	No	132,000	No	No
C_Deep	C8106	B2FYM5	27	29	Beryllium	µg/kg	235	63,216	No	1,510	No	No
C_Deep	C8106	B2FYM5	27	29	Cadmium	µg/kg	84.2	690	No	563	No	No
C_Deep	C8106	B2FYM5	27	29	Chloride	µg/kg	715	—	ND	100,000	No	No
C_Deep	C8106	B2FYM5	27	29	Chromium	µg/kg	22,200	480,096,000	No	18,500	Yes	No
C_Deep	C8106	B2FYM5	27	29	Cobalt	µg/kg	8,090	4,339	Yes	15,700	No	No
C_Deep	C8106	B2FYM5	27	29	Copper	µg/kg	13,100	284,160	No	22,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 11 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
C_Deep	C8106	B2FYM5	27	29	Fluoride	µg/kg	1,040	2,883,840	No	2,810	No	No
C_Deep	C8106	B2FYM5	27	29	Hexavalent Chromium	µg/kg	22,200	192	Yes	18,500	Yes	Yes
C_Deep	C8106	B2FYM5	27	29	Iron	µg/kg	20,200,000	5,644,800	Yes	32,600,000	No	No
C_Deep	C8106	B2FYM5	27	29	Lead	µg/kg	3,300	3,000,060	No	10,200	No	No
C_Deep	C8106	B2FYM5	27	29	Lithium	µg/kg	8,930	192,128	No	13,300	No	No
C_Deep	C8106	B2FYM5	27	29	Manganese	µg/kg	364,000	500,736	No	512,000	No	No
C_Deep	C8106	B2FYM5	27	29	Nickel	µg/kg	17,500	130,400	No	19,100	No	No
C_Deep	C8106	B2FYM5	27	29	Nitrate	µg/kg	4,040	—	ND	52,000	No	No
C_Deep	C8106	B2FYM5	27	29	Nitrite	µg/kg	424	—	ND	—	ND	No
C_Deep	C8106	B2FYM5	27	29	Phosphorus	µg/kg	551,000	—	ND	—	ND	No
C_Deep	C8106	B2FYM5	27	29	Strontium	µg/kg	38,200	6,758,400	No	—	ND	No
C_Deep	C8106	B2FYM5	27	29	Sulfate	µg/kg	11,900	—	ND	237,000	No	No
C_Deep	C8106	B2FYM5	27	29	Thallium	µg/kg	248	712	No	185	Yes	No
C_Deep	C8106	B2FYM5	27	29	Vanadium	µg/kg	49,300	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM5	27	29	Zinc	µg/kg	37,500	5,971,200	No	67,800	No	No
C_Deep	C8106	B2FYM6	64	66	Aluminum	µg/kg	6,520,000	480,064,000	No	11,800,000	No	No
C_Deep	C8106	B2FYM6	64	66	Antimony	µg/kg	55	5,424	No	130	No	No
C_Deep	C8106	B2FYM6	64	66	Arsenic	µg/kg	2,220	2,920	No	20,000	No	No
C_Deep	C8106	B2FYM6	64	66	Barium	µg/kg	60,800	1,648,000	No	132,000	No	No
C_Deep	C8106	B2FYM6	64	66	Beryllium	µg/kg	187	63,216	No	1,510	No	No
C_Deep	C8106	B2FYM6	64	66	Cadmium	µg/kg	71.5	690	No	563	No	No
C_Deep	C8106	B2FYM6	64	66	Chloride	µg/kg	477	—	ND	100,000	No	No
C_Deep	C8106	B2FYM6	64	66	Chromium	µg/kg	16,400	480,096,000	No	18,500	No	No
C_Deep	C8106	B2FYM6	64	66	Cobalt	µg/kg	7,680	4,339	Yes	15,700	No	No
C_Deep	C8106	B2FYM6	64	66	Copper	µg/kg	13,100	284,160	No	22,000	No	No
C_Deep	C8106	B2FYM6	64	66	Fluoride	µg/kg	908	2,883,840	No	2,810	No	No
C_Deep	C8106	B2FYM6	64	66	Hexavalent Chromium	µg/kg	16,400	192	Yes	18,500	No	No
C_Deep	C8106	B2FYM6	64	66	Iron	µg/kg	21,100,000	5,644,800	Yes	32,600,000	No	No
C_Deep	C8106	B2FYM6	64	66	Lead	µg/kg	2,390	3,000,060	No	10,200	No	No
C_Deep	C8106	B2FYM6	64	66	Lithium	µg/kg	6,570	192,128	No	13,300	No	No
C_Deep	C8106	B2FYM6	64	66	Manganese	µg/kg	279,000	500,736	No	512,000	No	No
C_Deep	C8106	B2FYM6	64	66	Nickel	µg/kg	12,600	130,400	No	19,100	No	No
C_Deep	C8106	B2FYM6	64	66	Nitrate	µg/kg	4,600	—	ND	52,000	No	No
C_Deep	C8106	B2FYM6	64	66	Nitrite	µg/kg	1,580	—	ND	—	ND	No
C_Deep	C8106	B2FYM6	64	66	Phosphorus	µg/kg	812,000	—	ND	—	ND	No
C_Deep	C8106	B2FYM6	64	66	Strontium	µg/kg	36,200	6,758,400	No	—	ND	No
C_Deep	C8106	B2FYM6	64	66	Sulfate	µg/kg	17,300	—	ND	237,000	No	No
C_Deep	C8106	B2FYM6	64	66	Thallium	µg/kg	186	712	No	185	Yes	No
C_Deep	C8106	B2FYM6	64	66	Vanadium	µg/kg	55,600	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM6	64	66	Zinc	µg/kg	37,700	5,971,200	No	67,800	No	No
C_Deep	C8106	B2FYM7	90	92	Aluminum	µg/kg	6,690,000	480,064,000	No	11,800,000	No	No
C_Deep	C8106	B2FYM7	90	92	Antimony	µg/kg	135	5,424	No	130	Yes	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 12 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
C_Deep	C8106	B2FYM7	90	92	Arsenic	µg/kg	4,010	2,920	Yes	20,000	No	No
C_Deep	C8106	B2FYM7	90	92	Barium	µg/kg	69,800	1,648,000	No	132,000	No	No
C_Deep	C8106	B2FYM7	90	92	Beryllium	µg/kg	220	63,216	No	1,510	No	No
C_Deep	C8106	B2FYM7	90	92	Cadmium	µg/kg	86.5	690	No	563	No	No
C_Deep	C8106	B2FYM7	90	92	Chloride	µg/kg	303	—	ND	100,000	No	No
C_Deep	C8106	B2FYM7	90	92	Chromium	µg/kg	22,000	480,096,000	No	18,500	Yes	No
C_Deep	C8106	B2FYM7	90	92	Cobalt	µg/kg	6,160	4,339	Yes	15,700	No	No
C_Deep	C8106	B2FYM7	90	92	Copper	µg/kg	10,800	284,160	No	22,000	No	No
C_Deep	C8106	B2FYM7	90	92	Fluoride	µg/kg	507	2,883,840	No	2,810	No	No
C_Deep	C8106	B2FYM7	90	92	Hexavalent Chromium	µg/kg	22,000	192	Yes	18,500	Yes	Yes
C_Deep	C8106	B2FYM7	90	92	Iron	µg/kg	18,400,000	5,644,800	Yes	32,600,000	No	No
C_Deep	C8106	B2FYM7	90	92	Lead	µg/kg	3,610	3,000,060	No	10,200	No	No
C_Deep	C8106	B2FYM7	90	92	Lithium	µg/kg	8,840	192,128	No	13,300	No	No
C_Deep	C8106	B2FYM7	90	92	Manganese	µg/kg	285,000	500,736	No	512,000	No	No
C_Deep	C8106	B2FYM7	90	92	Nickel	µg/kg	15,700	130,400	No	19,100	No	No
C_Deep	C8106	B2FYM7	90	92	Nitrate	µg/kg	3,080	—	ND	52,000	No	No
C_Deep	C8106	B2FYM7	90	92	Nitrite	µg/kg	1,470	—	ND	—	ND	No
C_Deep	C8106	B2FYM7	90	92	Phosphorus	µg/kg	576,000	—	ND	—	ND	No
C_Deep	C8106	B2FYM7	90	92	Silver	µg/kg	38.9	13,600	No	167	No	No
C_Deep	C8106	B2FYM7	90	92	Strontium	µg/kg	33,000	6,758,400	No	—	ND	No
C_Deep	C8106	B2FYM7	90	92	Sulfate	µg/kg	15,500	—	ND	237,000	No	No
C_Deep	C8106	B2FYM7	90	92	Thallium	µg/kg	204	712	No	185	Yes	No
C_Deep	C8106	B2FYM7	90	92	Vanadium	µg/kg	40,000	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM7	90	92	Zinc	µg/kg	34,600	5,971,200	No	67,800	No	No
C_Deep	C8106	B2FYM8	90	92	Aluminum	µg/kg	5,900,000	480,064,000	No	11,800,000	No	No
C_Deep	C8106	B2FYM8	90	92	Antimony	µg/kg	109	5,424	No	130	No	No
C_Deep	C8106	B2FYM8	90	92	Arsenic	µg/kg	3,450	2,920	Yes	20,000	No	No
C_Deep	C8106	B2FYM8	90	92	Barium	µg/kg	56,100	1,648,000	No	132,000	No	No
C_Deep	C8106	B2FYM8	90	92	Beryllium	µg/kg	209	63,216	No	1,510	No	No
C_Deep	C8106	B2FYM8	90	92	Cadmium	µg/kg	70.2	690	No	563	No	No
C_Deep	C8106	B2FYM8	90	92	Chloride	µg/kg	487	—	ND	100,000	No	No
C_Deep	C8106	B2FYM8	90	92	Chromium	µg/kg	12,900	480,096,000	No	18,500	No	No
C_Deep	C8106	B2FYM8	90	92	Cobalt	µg/kg	7,010	4,339	Yes	15,700	No	No
C_Deep	C8106	B2FYM8	90	92	Copper	µg/kg	10,300	284,160	No	22,000	No	No
C_Deep	C8106	B2FYM8	90	92	Fluoride	µg/kg	729	2,883,840	No	2,810	No	No
C_Deep	C8106	B2FYM8	90	92	Hexavalent Chromium	µg/kg	12,900	192	Yes	18,500	No	No
C_Deep	C8106	B2FYM8	90	92	Iron	µg/kg	16,100,000	5,644,800	Yes	32,600,000	No	No
C_Deep	C8106	B2FYM8	90	92	Lead	µg/kg	2,900	3,000,060	No	10,200	No	No
C_Deep	C8106	B2FYM8	90	92	Lithium	µg/kg	8,030	192,128	No	13,300	No	No
C_Deep	C8106	B2FYM8	90	92	Manganese	µg/kg	237,000	500,736	No	512,000	No	No
C_Deep	C8106	B2FYM8	90	92	Nickel	µg/kg	11,200	130,400	No	19,100	No	No
C_Deep	C8106	B2FYM8	90	92	Nitrate	µg/kg	3,020	—	ND	52,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 13 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
C_Deep	C8106	B2FYM8	90	92	Nitrite	µg/kg	1,860	—	ND	—	ND	No
C_Deep	C8106	B2FYM8	90	92	Phosphorus	µg/kg	510,000	—	ND	—	ND	No
C_Deep	C8106	B2FYM8	90	92	Strontium	µg/kg	31,700	6,758,400	No	—	ND	No
C_Deep	C8106	B2FYM8	90	92	Sulfate	µg/kg	41,500	—	ND	237,000	No	No
C_Deep	C8106	B2FYM8	90	92	Thallium	µg/kg	183	712	No	185	No	No
C_Deep	C8106	B2FYM8	90	92	Vanadium	µg/kg	34,600	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM8	90	92	Zinc	µg/kg	30,500	5,971,200	No	67,800	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Aluminum	µg/kg	6,310,000	480,064,000	No	11,800,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Antimony	µg/kg	169	5,424	No	130	Yes	No
C_Deep	C8106	B2FYM9	161.5	163.5	Arsenic	µg/kg	7,770	2,920	Yes	20,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Barium	µg/kg	54,400	1,648,000	No	132,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Beryllium	µg/kg	181	63,216	No	1,510	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Cadmium	µg/kg	79.8	690	No	563	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Chloride	µg/kg	728	—	ND	100,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Chromium	µg/kg	21,400	480,096,000	No	18,500	Yes	No
C_Deep	C8106	B2FYM9	161.5	163.5	Cobalt	µg/kg	5,800	4,339	Yes	15,700	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Copper	µg/kg	10,200	284,160	No	22,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Fluoride	µg/kg	752	2,883,840	No	2,810	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Hexavalent Chromium	µg/kg	21,400	192	Yes	18,500	Yes	Yes
C_Deep	C8106	B2FYM9	161.5	163.5	Iron	µg/kg	15,500,000	5,644,800	Yes	32,600,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Lead	µg/kg	3,650	3,000,060	No	10,200	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Lithium	µg/kg	9,230	192,128	No	13,300	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Manganese	µg/kg	259,000	500,736	No	512,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Nickel	µg/kg	18,200	130,400	No	19,100	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Nitrate	µg/kg	2,850	—	ND	52,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Nitrite	µg/kg	1,930	—	ND	—	ND	No
C_Deep	C8106	B2FYM9	161.5	163.5	Phosphorus	µg/kg	477,000	—	ND	—	ND	No
C_Deep	C8106	B2FYM9	161.5	163.5	Strontium	µg/kg	29,200	6,758,400	No	—	ND	No
C_Deep	C8106	B2FYM9	161.5	163.5	Sulfate	µg/kg	15,000	—	ND	237,000	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Thallium	µg/kg	162	712	No	185	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Vanadium	µg/kg	30,800	1,600,320	No	85,100	No	No
C_Deep	C8106	B2FYM9	161.5	163.5	Zinc	µg/kg	31,000	5,971,200	No	67,800	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Aluminum	µg/kg	8,270,000	480,064,000	No	11,800,000	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Barium	µg/kg	81,500	1,648,000	No	132,000	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Beryllium	µg/kg	323	63,216	No	1,510	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Chromium	µg/kg	9,290	480,096,000	No	18,500	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Cobalt	µg/kg	9,010	4,339	Yes	15,700	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Fluoride	µg/kg	557	2,883,840	No	2,810	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Hexavalent Chromium	µg/kg	9,290	192	Yes	18,500	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Iron	µg/kg	22,800,000	5,644,800	Yes	32,600,000	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Manganese	µg/kg	373,000	500,736	No	512,000	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Nickel	µg/kg	13,000	130,400	No	19,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 14 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
C_Shallow	C8106	B2FPR7	1	1.5	Nitrite	µg/kg	2,050	—	ND	—	ND	No
C_Shallow	C8106	B2FPR7	1	1.5	Phosphorus	µg/kg	865,000	—	ND	—	ND	No
C_Shallow	C8106	B2FPR7	1	1.5	Silver	µg/kg	45.9	13,600	No	167	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Sulfate	µg/kg	1,860	—	ND	237,000	No	No
C_Shallow	C8106	B2FPR7	1	1.5	Thallium	µg/kg	304	712	No	185	Yes	No
C_Shallow	C8106	B2FPR7	1	1.5	Zinc	µg/kg	44,600	5,971,200	No	67,800	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Antimony	µg/kg	283	5,424	No	130	Yes	No
C_Shallow	C8106	B2FPR8	1	1.5	Arsenic	µg/kg	6,700	2,920	Yes	20,000	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Butylbenzylphthalate	µg/kg	80.7	12,845	No	—	ND	No
C_Shallow	C8106	B2FPR8	1	1.5	Cadmium	µg/kg	109	690	No	563	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Chloride	µg/kg	434	—	ND	100,000	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Copper	µg/kg	13,200	284,160	No	22,000	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Lead	µg/kg	6,090	3,000,060	No	10,200	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Lithium	µg/kg	8,740	192,128	No	13,300	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Mercury	µg/kg	5.06	2,090	No	13.1	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Nitrate	µg/kg	4,210	—	ND	52,000	No	No
C_Shallow	C8106	B2FPR8	1	1.5	Strontium	µg/kg	33,100	6,758,400	No	—	ND	No
C_Shallow	C8106	B2FPR8	1	1.5	Vanadium	µg/kg	49,000	1,600,320	No	85,100	No	No
C_Shallow	C8106	B2FYM3	11	13	Aluminum	µg/kg	9,440,000	480,064,000	No	11,800,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Antimony	µg/kg	721	5,424	No	130	Yes	No
C_Shallow	C8106	B2FYM3	11	13	Arsenic	µg/kg	21,200	2,920	Yes	20,000	Yes	Yes
C_Shallow	C8106	B2FYM3	11	13	Barium	µg/kg	85,300	1,648,000	No	132,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Beryllium	µg/kg	403	63,216	No	1,510	No	No
C_Shallow	C8106	B2FYM3	11	13	Cadmium	µg/kg	150	690	No	563	No	No
C_Shallow	C8106	B2FYM3	11	13	Chloride	µg/kg	1,430	—	ND	100,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Chromium	µg/kg	10,600	480,096,000	No	18,500	No	No
C_Shallow	C8106	B2FYM3	11	13	Cobalt	µg/kg	9,600	4,339	Yes	15,700	No	No
C_Shallow	C8106	B2FYM3	11	13	Copper	µg/kg	18,100	284,160	No	22,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Fluoride	µg/kg	2,040	2,883,840	No	2,810	No	No
C_Shallow	C8106	B2FYM3	11	13	Hexavalent Chromium	µg/kg	10,600	192	Yes	18,500	No	No
C_Shallow	C8106	B2FYM3	11	13	Iron	µg/kg	23,700,000	5,644,800	Yes	32,600,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Lead	µg/kg	10,600	3,000,060	No	10,200	Yes	No
C_Shallow	C8106	B2FYM3	11	13	Lithium	µg/kg	12,100	192,128	No	13,300	No	No
C_Shallow	C8106	B2FYM3	11	13	Manganese	µg/kg	408,000	500,736	No	512,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Nickel	µg/kg	10,800	130,400	No	19,100	No	No
C_Shallow	C8106	B2FYM3	11	13	Nitrate	µg/kg	17,400	—	ND	52,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Nitrite	µg/kg	2,110	—	ND	—	ND	No
C_Shallow	C8106	B2FYM3	11	13	Phosphorus	µg/kg	749,000	—	ND	—	ND	No
C_Shallow	C8106	B2FYM3	11	13	Silver	µg/kg	80	13,600	No	167	No	No
C_Shallow	C8106	B2FYM3	11	13	Strontium	µg/kg	44,700	6,758,400	No	—	ND	No
C_Shallow	C8106	B2FYM3	11	13	Sulfate	µg/kg	8,420	—	ND	237,000	No	No
C_Shallow	C8106	B2FYM3	11	13	Thallium	µg/kg	287	712	No	185	Yes	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 15 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
C_Shallow	C8106	B2FYM3	11	13	Vanadium	µg/kg	52,400	1,600,320	No	85,100	No	No
C_Shallow	C8106	B2FYM3	11	13	Zinc	µg/kg	51,100	5,971,200	No	67,800	No	No
C_Shallow	C8106	B2FYM4	19	21	Aluminum	µg/kg	9,510,000	480,064,000	No	11,800,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Antimony	µg/kg	175	5,424	No	130	Yes	No
C_Shallow	C8106	B2FYM4	19	21	Arsenic	µg/kg	3,810	2,920	Yes	20,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Barium	µg/kg	98,800	1,648,000	No	132,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Beryllium	µg/kg	355	63,216	No	1,510	No	No
C_Shallow	C8106	B2FYM4	19	21	Cadmium	µg/kg	94.9	690	No	563	No	No
C_Shallow	C8106	B2FYM4	19	21	Chloride	µg/kg	766	—	ND	100,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Chromium	µg/kg	12,800	480,096,000	No	18,500	No	No
C_Shallow	C8106	B2FYM4	19	21	Cobalt	µg/kg	11,000	4,339	Yes	15,700	No	No
C_Shallow	C8106	B2FYM4	19	21	Copper	µg/kg	15,100	284,160	No	22,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Fluoride	µg/kg	2,290	2,883,840	No	2,810	No	No
C_Shallow	C8106	B2FYM4	19	21	Hexavalent Chromium	µg/kg	12,800	192	Yes	18,500	No	No
C_Shallow	C8106	B2FYM4	19	21	Iron	µg/kg	28,600,000	5,644,800	Yes	32,600,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Lead	µg/kg	3,710	3,000,060	No	10,200	No	No
C_Shallow	C8106	B2FYM4	19	21	Lithium	µg/kg	7,800	192,128	No	13,300	No	No
C_Shallow	C8106	B2FYM4	19	21	Manganese	µg/kg	449,000	500,736	No	512,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Mercury	µg/kg	3.9	2,090	No	13.1	No	No
C_Shallow	C8106	B2FYM4	19	21	Nickel	µg/kg	11,900	130,400	No	19,100	No	No
C_Shallow	C8106	B2FYM4	19	21	Nitrate	µg/kg	10,600	—	ND	52,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Nitrite	µg/kg	1,180	—	ND	—	ND	No
C_Shallow	C8106	B2FYM4	19	21	Phosphorus	µg/kg	691,000	—	ND	—	ND	No
C_Shallow	C8106	B2FYM4	19	21	Silver	µg/kg	40	13,600	No	167	No	No
C_Shallow	C8106	B2FYM4	19	21	Strontium	µg/kg	36,700	6,758,400	No	—	ND	No
C_Shallow	C8106	B2FYM4	19	21	Sulfate	µg/kg	27,700	—	ND	237,000	No	No
C_Shallow	C8106	B2FYM4	19	21	Thallium	µg/kg	272	712	No	185	Yes	No
C_Shallow	C8106	B2FYM4	19	21	Vanadium	µg/kg	78,500	1,600,320	No	85,100	No	No
C_Shallow	C8106	B2FYM4	19	21	Zinc	µg/kg	44,800	5,971,200	No	67,800	No	No
E_Deep	C7672	B26C76	37	39	Aluminum	µg/kg	9,330,000	480,064,000	No	11,800,000	No	No
E_Deep	C7672	B26C76	37	39	Antimony	µg/kg	121	5,424	No	130	No	No
E_Deep	C7672	B26C76	37	39	Arsenic	µg/kg	2,240	2,920	No	20,000	No	No
E_Deep	C7672	B26C76	37	39	Barium	µg/kg	99,900	1,648,000	No	132,000	No	No
E_Deep	C7672	B26C76	37	39	Beryllium	µg/kg	153	63,216	No	1,510	No	No
E_Deep	C7672	B26C76	37	39	Butylbenzylphthalate	µg/kg	125	12,845	No	—	ND	No
E_Deep	C7672	B26C76	37	39	Cadmium	µg/kg	2,110	690	Yes	563	Yes	Yes
E_Deep	C7672	B26C76	37	39	Chloride	µg/kg	2,330	—	ND	100,000	No	No
E_Deep	C7672	B26C76	37	39	Chromium	µg/kg	29,800	480,096,000	No	18,500	Yes	No
E_Deep	C7672	B26C76	37	39	Cobalt	µg/kg	11,300	4,339	Yes	15,700	No	No
E_Deep	C7672	B26C76	37	39	Copper	µg/kg	15,300	284,160	No	22,000	No	No
E_Deep	C7672	B26C76	37	39	Fluoride	µg/kg	2,870	2,883,840	No	2,810	Yes	No
E_Deep	C7672	B26C76	37	39	Hexavalent Chromium	µg/kg	29,800	192	Yes	18,500	Yes	Yes

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 16 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Deep	C7672	B26C76	37	39	Iron	µg/kg	22,900,000	5,644,800	Yes	32,600,000	No	No
E_Deep	C7672	B26C76	37	39	Lithium	µg/kg	8,130	192,128	No	13,300	No	No
E_Deep	C7672	B26C76	37	39	Manganese	µg/kg	310,000	500,736	No	512,000	No	No
E_Deep	C7672	B26C76	37	39	Nickel	µg/kg	19,300	130,400	No	19,100	Yes	No
E_Deep	C7672	B26C76	37	39	Nitrate	µg/kg	5,980	—	ND	52,000	No	No
E_Deep	C7672	B26C76	37	39	Nitrite	µg/kg	1,470	—	ND	—	ND	No
E_Deep	C7672	B26C76	37	39	Phosphorus	µg/kg	832,000	—	ND	—	ND	No
E_Deep	C7672	B26C76	37	39	Selenium	µg/kg	344	5,200	No	780	No	No
E_Deep	C7672	B26C76	37	39	Silver	µg/kg	78	13,600	No	167	No	No
E_Deep	C7672	B26C76	37	39	Strontium	µg/kg	56,200	6,758,400	No	—	ND	No
E_Deep	C7672	B26C76	37	39	Sulfate	µg/kg	75,500	—	ND	237,000	No	No
E_Deep	C7672	B26C76	37	39	Thallium	µg/kg	59.4	712	No	185	No	No
E_Deep	C7672	B26C76	37	39	Vanadium	µg/kg	63,700	1,600,320	No	85,100	No	No
E_Deep	C7672	B26C76	37	39	Zinc	µg/kg	43,000	5,971,200	No	67,800	No	No
E_Deep	C7672	B26C78	73	75	Aluminum	µg/kg	6,830,000	480,064,000	No	11,800,000	No	No
E_Deep	C7672	B26C78	73	75	Antimony	µg/kg	114	5,424	No	130	No	No
E_Deep	C7672	B26C78	73	75	Arsenic	µg/kg	3,710	2,920	Yes	20,000	No	No
E_Deep	C7672	B26C78	73	75	Barium	µg/kg	53,200	1,648,000	No	132,000	No	No
E_Deep	C7672	B26C78	73	75	Beryllium	µg/kg	173	63,216	No	1,510	No	No
E_Deep	C7672	B26C78	73	75	Butylbenzylphthalate	µg/kg	110	12,845	No	—	ND	No
E_Deep	C7672	B26C78	73	75	Cadmium	µg/kg	1,900	690	Yes	563	Yes	Yes
E_Deep	C7672	B26C78	73	75	Chloride	µg/kg	833	—	ND	100,000	No	No
E_Deep	C7672	B26C78	73	75	Chromium	µg/kg	27,600	480,096,000	No	18,500	Yes	No
E_Deep	C7672	B26C78	73	75	Cobalt	µg/kg	6,270	4,339	Yes	15,700	No	No
E_Deep	C7672	B26C78	73	75	Copper	µg/kg	10,800	284,160	No	22,000	No	No
E_Deep	C7672	B26C78	73	75	Fluoride	µg/kg	776	2,883,840	No	2,810	No	No
E_Deep	C7672	B26C78	73	75	Hexavalent Chromium	µg/kg	27,600	192	Yes	18,500	Yes	Yes
E_Deep	C7672	B26C78	73	75	Iron	µg/kg	16,200,000	5,644,800	Yes	32,600,000	No	No
E_Deep	C7672	B26C78	73	75	Lithium	µg/kg	8,250	192,128	No	13,300	No	No
E_Deep	C7672	B26C78	73	75	Manganese	µg/kg	282,000	500,736	No	512,000	No	No
E_Deep	C7672	B26C78	73	75	Nickel	µg/kg	25,300	130,400	No	19,100	Yes	No
E_Deep	C7672	B26C78	73	75	Nitrate	µg/kg	3,650	—	ND	52,000	No	No
E_Deep	C7672	B26C78	73	75	Nitrite	µg/kg	1,200	—	ND	—	ND	No
E_Deep	C7672	B26C78	73	75	Phosphorus	µg/kg	495,000	—	ND	—	ND	No
E_Deep	C7672	B26C78	73	75	Selenium	µg/kg	245	5,200	No	780	No	No
E_Deep	C7672	B26C78	73	75	Silver	µg/kg	54.4	13,600	No	167	No	No
E_Deep	C7672	B26C78	73	75	Strontium	µg/kg	29,100	6,758,400	No	—	ND	No
E_Deep	C7672	B26C78	73	75	Sulfate	µg/kg	8,470	—	ND	237,000	No	No
E_Deep	C7672	B26C78	73	75	Thallium	µg/kg	65.8	712	No	185	No	No
E_Deep	C7672	B26C78	73	75	Vanadium	µg/kg	34,800	1,600,320	No	85,100	No	No
E_Deep	C7672	B26C78	73	75	Zinc	µg/kg	31,200	5,971,200	No	67,800	No	No
E_Deep	C7672	B26C79	73	75	2-Butanone	µg/kg	6.58	19,652	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 17 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Deep	C7672	B26C79	73	75	Toluene	µg/kg	0.734	4,654	No	—	ND	No
E_Deep	C7672	B26C80	83	85	Aluminum	µg/kg	7,380,000	480,064,000	No	11,800,000	No	No
E_Deep	C7672	B26C80	83	85	Antimony	µg/kg	263	5,424	No	130	Yes	No
E_Deep	C7672	B26C80	83	85	Arsenic	µg/kg	3,400	2,920	Yes	20,000	No	No
E_Deep	C7672	B26C80	83	85	Barium	µg/kg	76,800	1,648,000	No	132,000	No	No
E_Deep	C7672	B26C80	83	85	Beryllium	µg/kg	195	63,216	No	1,510	No	No
E_Deep	C7672	B26C80	83	85	Cadmium	µg/kg	1,760	690	Yes	563	Yes	Yes
E_Deep	C7672	B26C80	83	85	Chloride	µg/kg	1,360	—	ND	100,000	No	No
E_Deep	C7672	B26C80	83	85	Chromium	µg/kg	16,500	480,096,000	No	18,500	No	No
E_Deep	C7672	B26C80	83	85	Cobalt	µg/kg	5,980	4,339	Yes	15,700	No	No
E_Deep	C7672	B26C80	83	85	Copper	µg/kg	9,490	284,160	No	22,000	No	No
E_Deep	C7672	B26C80	83	85	Fluoride	µg/kg	1,190	2,883,840	No	2,810	No	No
E_Deep	C7672	B26C80	83	85	Hexavalent Chromium	µg/kg	16,500	192	Yes	18,500	No	No
E_Deep	C7672	B26C80	83	85	Iron	µg/kg	15,100,000	5,644,800	Yes	32,600,000	No	No
E_Deep	C7672	B26C80	83	85	Lithium	µg/kg	10,800	192,128	No	13,300	No	No
E_Deep	C7672	B26C80	83	85	Manganese	µg/kg	286,000	500,736	No	512,000	No	No
E_Deep	C7672	B26C80	83	85	Nickel	µg/kg	14,300	130,400	No	19,100	No	No
E_Deep	C7672	B26C80	83	85	Nitrate	µg/kg	8,920	—	ND	52,000	No	No
E_Deep	C7672	B26C80	83	85	Nitrite	µg/kg	721	—	ND	—	ND	No
E_Deep	C7672	B26C80	83	85	Phosphorus	µg/kg	467,000	—	ND	—	ND	No
E_Deep	C7672	B26C80	83	85	Selenium	µg/kg	195	5,200	No	780	No	No
E_Deep	C7672	B26C80	83	85	Silver	µg/kg	46.4	13,600	No	167	No	No
E_Deep	C7672	B26C80	83	85	Strontium	µg/kg	31,900	6,758,400	No	—	ND	No
E_Deep	C7672	B26C80	83	85	Sulfate	µg/kg	54,000	—	ND	237,000	No	No
E_Deep	C7672	B26C80	83	85	Thallium	µg/kg	84.5	712	No	185	No	No
E_Deep	C7672	B26C80	83	85	Vanadium	µg/kg	29,600	1,600,320	No	85,100	No	No
E_Deep	C7672	B26C80	83	85	Zinc	µg/kg	32,600	5,971,200	No	67,800	No	No
E_Deep	C7672	B26C81	83	85	Styrene	µg/kg	0.784	2,244	No	—	ND	No
E_Deep	C7672	B26C81	83	85	Toluene	µg/kg	0.402	4,654	No	—	ND	No
E_Deep	C7672	B26C82	122	124	Aluminum	µg/kg	6,680,000	480,064,000	No	11,800,000	No	No
E_Deep	C7672	B26C82	122	124	Antimony	µg/kg	93	5,424	No	130	No	No
E_Deep	C7672	B26C82	122	124	Arsenic	µg/kg	2,910	2,920	No	20,000	No	No
E_Deep	C7672	B26C82	122	124	Barium	µg/kg	71,600	1,648,000	No	132,000	No	No
E_Deep	C7672	B26C82	122	124	Beryllium	µg/kg	125	63,216	No	1,510	No	No
E_Deep	C7672	B26C82	122	124	Cadmium	µg/kg	2,440	690	Yes	563	Yes	Yes
E_Deep	C7672	B26C82	122	124	Chloride	µg/kg	552	—	ND	100,000	No	No
E_Deep	C7672	B26C82	122	124	Chromium	µg/kg	20,300	480,096,000	No	18,500	Yes	No
E_Deep	C7672	B26C82	122	124	Cobalt	µg/kg	5,590	4,339	Yes	15,700	No	No
E_Deep	C7672	B26C82	122	124	Copper	µg/kg	11,900	284,160	No	22,000	No	No
E_Deep	C7672	B26C82	122	124	Fluoride	µg/kg	171	2,883,840	No	2,810	No	No
E_Deep	C7672	B26C82	122	124	Hexavalent Chromium	µg/kg	20,300	192	Yes	18,500	Yes	Yes
E_Deep	C7672	B26C82	122	124	Iron	µg/kg	17,800,000	5,644,800	Yes	32,600,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 18 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Deep	C7672	B26C82	122	124	Lithium	µg/kg	8,450	192,128	No	13,300	No	No
E_Deep	C7672	B26C82	122	124	Manganese	µg/kg	265,000	500,736	No	512,000	No	No
E_Deep	C7672	B26C82	122	124	Molybdenum	µg/kg	2,540	32,320	No	470	Yes	No
E_Deep	C7672	B26C82	122	124	Nickel	µg/kg	11,200	130,400	No	19,100	No	No
E_Deep	C7672	B26C82	122	124	Nitrate	µg/kg	2,320	—	ND	52,000	No	No
E_Deep	C7672	B26C82	122	124	Nitrite	µg/kg	764	—	ND	—	ND	No
E_Deep	C7672	B26C82	122	124	Phosphorus	µg/kg	596,000	—	ND	—	ND	No
E_Deep	C7672	B26C82	122	124	Selenium	µg/kg	568	5,200	No	780	No	No
E_Deep	C7672	B26C82	122	124	Silver	µg/kg	69.8	13,600	No	167	No	No
E_Deep	C7672	B26C82	122	124	Strontium	µg/kg	37,200	6,758,400	No	—	ND	No
E_Deep	C7672	B26C82	122	124	Sulfate	µg/kg	84,500	—	ND	237,000	No	No
E_Deep	C7672	B26C82	122	124	Thallium	µg/kg	62.2	712	No	185	No	No
E_Deep	C7672	B26C82	122	124	Vanadium	µg/kg	38,400	1,600,320	No	85,100	No	No
E_Deep	C7672	B26C82	122	124	Zinc	µg/kg	32,600	5,971,200	No	67,800	No	No
E_Deep	C7672	B26C83	122	124	Acetone	µg/kg	5.41	28,903	No	—	ND	No
E_Deep	C7672	B26C83	122	124	Toluene	µg/kg	0.559	4,654	No	—	ND	No
E_Shallow	C7672	B26C68	5	7	Aluminum	µg/kg	7,170,000	480,064,000	No	11,800,000	No	No
E_Shallow	C7672	B26C68	5	7	Antimony	µg/kg	157	5,424	No	130	Yes	No
E_Shallow	C7672	B26C68	5	7	Arsenic	µg/kg	5,070	2,920	Yes	20,000	No	No
E_Shallow	C7672	B26C68	5	7	Barium	µg/kg	75,000	1,648,000	No	132,000	No	No
E_Shallow	C7672	B26C68	5	7	Beryllium	µg/kg	159	63,216	No	1,510	No	No
E_Shallow	C7672	B26C68	5	7	Butylbenzylphthalate	µg/kg	123	12,845	No	—	ND	No
E_Shallow	C7672	B26C68	5	7	Cadmium	µg/kg	2,700	690	Yes	563	Yes	Yes
E_Shallow	C7672	B26C68	5	7	Chloride	µg/kg	478	—	ND	100,000	No	No
E_Shallow	C7672	B26C68	5	7	Chromium	µg/kg	10,400	480,096,000	No	18,500	No	No
E_Shallow	C7672	B26C68	5	7	Cobalt	µg/kg	8,120	4,339	Yes	15,700	No	No
E_Shallow	C7672	B26C68	5	7	Copper	µg/kg	12,700	284,160	No	22,000	No	No
E_Shallow	C7672	B26C68	5	7	Fluoride	µg/kg	1,410	2,883,840	No	2,810	No	No
E_Shallow	C7672	B26C68	5	7	Hexavalent Chromium	µg/kg	10,400	192	Yes	18,500	No	No
E_Shallow	C7672	B26C68	5	7	Iron	µg/kg	22,400,000	5,644,800	Yes	32,600,000	No	No
E_Shallow	C7672	B26C68	5	7	Lithium	µg/kg	7,420	192,128	No	13,300	No	No
E_Shallow	C7672	B26C68	5	7	Manganese	µg/kg	332,000	500,736	No	512,000	No	No
E_Shallow	C7672	B26C68	5	7	Nickel	µg/kg	7,820	130,400	No	19,100	No	No
E_Shallow	C7672	B26C68	5	7	Nitrate	µg/kg	4,060	—	ND	52,000	No	No
E_Shallow	C7672	B26C68	5	7	Nitrite	µg/kg	1,030	—	ND	—	ND	No
E_Shallow	C7672	B26C68	5	7	Phosphorus	µg/kg	851,000	—	ND	—	ND	No
E_Shallow	C7672	B26C68	5	7	Selenium	µg/kg	343	5,200	No	780	No	No
E_Shallow	C7672	B26C68	5	7	Silver	µg/kg	75.3	13,600	No	167	No	No
E_Shallow	C7672	B26C68	5	7	Strontium	µg/kg	31,800	6,758,400	No	—	ND	No
E_Shallow	C7672	B26C68	5	7	Sulfate	µg/kg	30,500	—	ND	237,000	No	No
E_Shallow	C7672	B26C68	5	7	Thallium	µg/kg	80.1	712	No	185	No	No
E_Shallow	C7672	B26C68	5	7	Vanadium	µg/kg	53,100	1,600,320	No	85,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 19 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Shallow	C7672	B26C68	5	7	Zinc	µg/kg	41,900	5,971,200	No	67,800	No	No
E_Shallow	C7672	B26C69	5	7	Acetone	µg/kg	4.14	28,903	No	—	ND	No
E_Shallow	C7672	B26C69	5	7	Toluene	µg/kg	0.236	4,654	No	—	ND	No
E_Shallow	C7672	B26C70	10	12	Aldrin	µg/kg	2	2.5	No	—	ND	No
E_Shallow	C7672	B26C70	10	12	Aluminum	µg/kg	7,420,000	480,064,000	No	11,800,000	No	No
E_Shallow	C7672	B26C70	10	12	Antimony	µg/kg	92.6	5,424	No	130	No	No
E_Shallow	C7672	B26C70	10	12	Arsenic	µg/kg	3,390	2,920	Yes	20,000	No	No
E_Shallow	C7672	B26C70	10	12	Barium	µg/kg	76,400	1,648,000	No	132,000	No	No
E_Shallow	C7672	B26C70	10	12	Beryllium	µg/kg	158	63,216	No	1,510	No	No
E_Shallow	C7672	B26C70	10	12	Cadmium	µg/kg	2,870	690	Yes	563	Yes	Yes
E_Shallow	C7672	B26C70	10	12	Chloride	µg/kg	355	—	ND	100,000	No	No
E_Shallow	C7672	B26C70	10	12	Chromium	µg/kg	17,200	480,096,000	No	18,500	No	No
E_Shallow	C7672	B26C70	10	12	Cobalt	µg/kg	7,990	4,339	Yes	15,700	No	No
E_Shallow	C7672	B26C70	10	12	Copper	µg/kg	16,500	284,160	No	22,000	No	No
E_Shallow	C7672	B26C70	10	12	Fluoride	µg/kg	1,480	2,883,840	No	2,810	No	No
E_Shallow	C7672	B26C70	10	12	Hexavalent Chromium	µg/kg	17,200	192	Yes	18,500	No	No
E_Shallow	C7672	B26C70	10	12	Iron	µg/kg	22,100,000	5,644,800	Yes	32,600,000	No	No
E_Shallow	C7672	B26C70	10	12	Lithium	µg/kg	7,730	192,128	No	13,300	No	No
E_Shallow	C7672	B26C70	10	12	Manganese	µg/kg	331,000	500,736	No	512,000	No	No
E_Shallow	C7672	B26C70	10	12	Nickel	µg/kg	12,400	130,400	No	19,100	No	No
E_Shallow	C7672	B26C70	10	12	Nitrate	µg/kg	2,850	—	ND	52,000	No	No
E_Shallow	C7672	B26C70	10	12	Nitrite	µg/kg	1,400	—	ND	—	ND	No
E_Shallow	C7672	B26C70	10	12	Phosphorus	µg/kg	786,000	—	ND	—	ND	No
E_Shallow	C7672	B26C70	10	12	Selenium	µg/kg	210	5,200	No	780	No	No
E_Shallow	C7672	B26C70	10	12	Silver	µg/kg	66.7	13,600	No	167	No	No
E_Shallow	C7672	B26C70	10	12	Strontium	µg/kg	34,700	6,758,400	No	—	ND	No
E_Shallow	C7672	B26C70	10	12	Sulfate	µg/kg	3,080	—	ND	237,000	No	No
E_Shallow	C7672	B26C70	10	12	Thallium	µg/kg	74.4	712	No	185	No	No
E_Shallow	C7672	B26C70	10	12	Vanadium	µg/kg	54,600	1,600,320	No	85,100	No	No
E_Shallow	C7672	B26C70	10	12	Zinc	µg/kg	39,800	5,971,200	No	67,800	No	No
E_Shallow	C7672	B26C71	10	12	Acetone	µg/kg	6.63	28,903	No	—	ND	No
E_Shallow	C7672	B26C71	10	12	Toluene	µg/kg	0.337	4,654	No	—	ND	No
E_Shallow	C7672	B26C74	14	16	Aluminum	µg/kg	6,810,000	480,064,000	No	11,800,000	No	No
E_Shallow	C7672	B26C74	14	16	Antimony	µg/kg	164	5,424	No	130	Yes	No
E_Shallow	C7672	B26C74	14	16	Arsenic	µg/kg	2,990	2,920	Yes	20,000	No	No
E_Shallow	C7672	B26C74	14	16	Barium	µg/kg	78,400	1,648,000	No	132,000	No	No
E_Shallow	C7672	B26C74	14	16	Beryllium	µg/kg	147	63,216	No	1,510	No	No
E_Shallow	C7672	B26C74	14	16	Butylbenzylphthalate	µg/kg	121	12,845	No	—	ND	No
E_Shallow	C7672	B26C74	14	16	Cadmium	µg/kg	3,180	690	Yes	563	Yes	Yes
E_Shallow	C7672	B26C74	14	16	Chloride	µg/kg	563	—	ND	100,000	No	No
E_Shallow	C7672	B26C74	14	16	Chromium	µg/kg	11,900	480,096,000	No	18,500	No	No
E_Shallow	C7672	B26C74	14	16	Cobalt	µg/kg	7,620	4,339	Yes	15,700	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 20 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Shallow	C7672	B26C74	14	16	Copper	µg/kg	12,000	284,160	No	22,000	No	No
E_Shallow	C7672	B26C74	14	16	Fluoride	µg/kg	1,230	2,883,840	No	2,810	No	No
E_Shallow	C7672	B26C74	14	16	Hexavalent Chromium	µg/kg	11,900	192	Yes	18,500	No	No
E_Shallow	C7672	B26C74	14	16	Iron	µg/kg	21,600,000	5,644,800	Yes	32,600,000	No	No
E_Shallow	C7672	B26C74	14	16	Lithium	µg/kg	7,030	192,128	No	13,300	No	No
E_Shallow	C7672	B26C74	14	16	Manganese	µg/kg	298,000	500,736	No	512,000	No	No
E_Shallow	C7672	B26C74	14	16	Nickel	µg/kg	11,100	130,400	No	19,100	No	No
E_Shallow	C7672	B26C74	14	16	Nitrate	µg/kg	3,720	—	ND	52,000	No	No
E_Shallow	C7672	B26C74	14	16	Nitrite	µg/kg	724	—	ND	—	ND	No
E_Shallow	C7672	B26C74	14	16	Phosphorus	µg/kg	801,000	—	ND	—	ND	No
E_Shallow	C7672	B26C74	14	16	Selenium	µg/kg	305	5,200	No	780	No	No
E_Shallow	C7672	B26C74	14	16	Silver	µg/kg	74.1	13,600	No	167	No	No
E_Shallow	C7672	B26C74	14	16	Strontium	µg/kg	30,100	6,758,400	No	—	ND	No
E_Shallow	C7672	B26C74	14	16	Sulfate	µg/kg	3,400	—	ND	237,000	No	No
E_Shallow	C7672	B26C74	14	16	Thallium	µg/kg	63.7	712	No	185	No	No
E_Shallow	C7672	B26C74	14	16	Vanadium	µg/kg	50,000	1,600,320	No	85,100	No	No
E_Shallow	C7672	B26C74	14	16	Zinc	µg/kg	42,200	5,971,200	No	67,800	No	No
E_Shallow	C7672	B26C75	14	16	Acetone	µg/kg	4.83	28,903	No	—	ND	No
E_Shallow	C7672	B26C75	14	16	Toluene	µg/kg	0.284	4,654	No	—	ND	No
E_Shallow	C7672	B26JK2	0	1	Antimony	µg/kg	178	5,424	No	130	Yes	No
E_Shallow	C7672	B26JK2	0	1	Beryllium	µg/kg	158	63,216	No	1,510	No	No
E_Shallow	C7672	B26JK2	0	1	Butylbenzylphthalate	µg/kg	124	12,845	No	—	ND	No
E_Shallow	C7672	B26JK2	0	1	Lithium	µg/kg	9,130	192,128	No	13,300	No	No
E_Shallow	C7672	B26JK2	0	1	Manganese	µg/kg	495,000	500,736	No	512,000	No	No
E_Shallow	C7672	B26JK2	0	1	Nickel	µg/kg	9,550	130,400	No	19,100	No	No
E_Shallow	C7672	B26JK2	0	1	Selenium	µg/kg	560	5,200	No	780	No	No
E_Shallow	C7672	B26JK3	0	1	Aluminum	µg/kg	7,080,000	480,064,000	No	11,800,000	No	No
E_Shallow	C7672	B26JK3	0	1	Arsenic	µg/kg	5,200	2,920	Yes	20,000	No	No
E_Shallow	C7672	B26JK3	0	1	Barium	µg/kg	76,600	1,648,000	No	132,000	No	No
E_Shallow	C7672	B26JK3	0	1	Cadmium	µg/kg	3,260	690	Yes	563	Yes	Yes
E_Shallow	C7672	B26JK3	0	1	Chloride	µg/kg	475	—	ND	100,000	No	No
E_Shallow	C7672	B26JK3	0	1	Chromium	µg/kg	7,980	480,096,000	No	18,500	No	No
E_Shallow	C7672	B26JK3	0	1	Cobalt	µg/kg	8,820	4,339	Yes	15,700	No	No
E_Shallow	C7672	B26JK3	0	1	Copper	µg/kg	12,900	284,160	No	22,000	No	No
E_Shallow	C7672	B26JK3	0	1	Fluoride	µg/kg	995	2,883,840	No	2,810	No	No
E_Shallow	C7672	B26JK3	0	1	Hexavalent Chromium	µg/kg	7,980	192	Yes	18,500	No	No
E_Shallow	C7672	B26JK3	0	1	Iron	µg/kg	24,200,000	5,644,800	Yes	32,600,000	No	No
E_Shallow	C7672	B26JK3	0	1	Mercury	µg/kg	23.2	2,090	No	13.1	Yes	No
E_Shallow	C7672	B26JK3	0	1	Nitrate	µg/kg	5,020	—	ND	52,000	No	No
E_Shallow	C7672	B26JK3	0	1	Nitrite	µg/kg	1,060	—	ND	—	ND	No
E_Shallow	C7672	B26JK3	0	1	Phosphorus	µg/kg	870,000	—	ND	—	ND	No
E_Shallow	C7672	B26JK3	0	1	Silver	µg/kg	85	13,600	No	167	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 21 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
E_Shallow	C7672	B26JK3	0	1	Strontium	µg/kg	28,900	6,758,400	No	—	ND	No
E_Shallow	C7672	B26JK3	0	1	Sulfate	µg/kg	2,810	—	ND	237,000	No	No
E_Shallow	C7672	B26JK3	0	1	Thallium	µg/kg	78.8	712	No	185	No	No
E_Shallow	C7672	B26JK3	0	1	Vanadium	µg/kg	58,800	1,600,320	No	85,100	No	No
E_Shallow	C7672	B26JK3	0	1	Zinc	µg/kg	44,800	5,971,200	No	67,800	No	No
E_Shallow	C7672	B26JL2	0	1	Toluene	µg/kg	0.232	4,654	No	—	ND	No
F+G_Deep	C7468	B21202	43.5	45.5	Aluminum	µg/kg	6,660,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Arsenic	µg/kg	2,490	2,920	No	20,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Barium	µg/kg	61,900	1,648,000	No	132,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Bis(2-ethylhexyl) phthalate	µg/kg	746	13,359	No	—	ND	No
F+G_Deep	C7468	B21202	43.5	45.5	Chloride	µg/kg	1,200	—	ND	100,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Chromium	µg/kg	11,700	480,096,000	No	18,500	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Cobalt	µg/kg	7,150	4,339	Yes	15,700	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Copper	µg/kg	10,000	284,160	No	22,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Fluoride	µg/kg	1,640	2,883,840	No	2,810	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Hexavalent Chromium	µg/kg	11,700	192	Yes	18,500	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Iron	µg/kg	16,200,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Lead	µg/kg	3,560	3,000,060	No	10,200	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Lithium	µg/kg	6,960	192,128	No	13,300	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Manganese	µg/kg	265,000	500,736	No	512,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Nickel	µg/kg	14,800	130,400	No	19,100	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Nitrate	µg/kg	4,080	—	ND	52,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Nitrite	µg/kg	465	—	ND	—	ND	No
F+G_Deep	C7468	B21202	43.5	45.5	Phosphorus	µg/kg	569,000	—	ND	—	ND	No
F+G_Deep	C7468	B21202	43.5	45.5	Strontium	µg/kg	30,500	6,758,400	No	—	ND	No
F+G_Deep	C7468	B21202	43.5	45.5	Sulfate	µg/kg	17,900	—	ND	237,000	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Thallium	µg/kg	77.8	712	No	185	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Vanadium	µg/kg	36,400	1,600,320	No	85,100	No	No
F+G_Deep	C7468	B21202	43.5	45.5	Zinc	µg/kg	29,900	5,971,200	No	67,800	No	No
F+G_Deep	C7468	B21204	43.5	45.5	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Deep	C7468	B21204	43.5	45.5	Styrene	µg/kg	0.32	2,244	No	—	ND	No
F+G_Deep	C7468	B21205	92	94	Aluminum	µg/kg	5,330,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7468	B21205	92	94	Arsenic	µg/kg	2,880	2,920	No	20,000	No	No
F+G_Deep	C7468	B21205	92	94	Barium	µg/kg	101,000	1,648,000	No	132,000	No	No
F+G_Deep	C7468	B21205	92	94	Bis(2-ethylhexyl) phthalate	µg/kg	2,930	13,359	No	—	ND	No
F+G_Deep	C7468	B21205	92	94	Chloride	µg/kg	1,300	—	ND	100,000	No	No
F+G_Deep	C7468	B21205	92	94	Chromium	µg/kg	11,500	480,096,000	No	18,500	No	No
F+G_Deep	C7468	B21205	92	94	Cobalt	µg/kg	5,850	4,339	Yes	15,700	No	No
F+G_Deep	C7468	B21205	92	94	Copper	µg/kg	7,560	284,160	No	22,000	No	No
F+G_Deep	C7468	B21205	92	94	Fluoride	µg/kg	1,190	2,883,840	No	2,810	No	No
F+G_Deep	C7468	B21205	92	94	Hexavalent Chromium	µg/kg	11,500	192	Yes	18,500	No	No
F+G_Deep	C7468	B21205	92	94	Iron	µg/kg	12,700,000	5,644,800	Yes	32,600,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 22 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7468	B21205	92	94	Lead	µg/kg	3,160	3,000,060	No	10,200	No	No
F+G_Deep	C7468	B21205	92	94	Lithium	µg/kg	7,670	192,128	No	13,300	No	No
F+G_Deep	C7468	B21205	92	94	Manganese	µg/kg	386,000	500,736	No	512,000	No	No
F+G_Deep	C7468	B21205	92	94	Nickel	µg/kg	10,600	130,400	No	19,100	No	No
F+G_Deep	C7468	B21205	92	94	Nitrate	µg/kg	1,940	—	ND	52,000	No	No
F+G_Deep	C7468	B21205	92	94	Nitrite	µg/kg	302	—	ND	—	ND	No
F+G_Deep	C7468	B21205	92	94	Phosphorus	µg/kg	421,000	—	ND	—	ND	No
F+G_Deep	C7468	B21205	92	94	Strontium	µg/kg	22,400	6,758,400	No	—	ND	No
F+G_Deep	C7468	B21205	92	94	Sulfate	µg/kg	20,000	—	ND	237,000	No	No
F+G_Deep	C7468	B21205	92	94	Thallium	µg/kg	68.3	712	No	185	No	No
F+G_Deep	C7468	B21205	92	94	Vanadium	µg/kg	32,300	1,600,320	No	85,100	No	No
F+G_Deep	C7468	B21205	92	94	Zinc	µg/kg	25,100	5,971,200	No	67,800	No	No
F+G_Deep	C7468	B21207	92	94	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Deep	C7468	B21208	97	99	Aluminum	µg/kg	6,300,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7468	B21208	97	99	Arsenic	µg/kg	3,040	2,920	Yes	20,000	No	No
F+G_Deep	C7468	B21208	97	99	Barium	µg/kg	63,200	1,648,000	No	132,000	No	No
F+G_Deep	C7468	B21208	97	99	Chloride	µg/kg	583	—	ND	100,000	No	No
F+G_Deep	C7468	B21208	97	99	Chromium	µg/kg	14,200	480,096,000	No	18,500	No	No
F+G_Deep	C7468	B21208	97	99	Cobalt	µg/kg	5,650	4,339	Yes	15,700	No	No
F+G_Deep	C7468	B21208	97	99	Copper	µg/kg	8,230	284,160	No	22,000	No	No
F+G_Deep	C7468	B21208	97	99	Fluoride	µg/kg	2,140	2,883,840	No	2,810	No	No
F+G_Deep	C7468	B21208	97	99	Hexavalent Chromium	µg/kg	14,200	192	Yes	18,500	No	No
F+G_Deep	C7468	B21208	97	99	Iron	µg/kg	13,700,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7468	B21208	97	99	Lead	µg/kg	4,910	3,000,060	No	10,200	No	No
F+G_Deep	C7468	B21208	97	99	Lithium	µg/kg	8,920	192,128	No	13,300	No	No
F+G_Deep	C7468	B21208	97	99	Manganese	µg/kg	309,000	500,736	No	512,000	No	No
F+G_Deep	C7468	B21208	97	99	Nickel	µg/kg	13,800	130,400	No	19,100	No	No
F+G_Deep	C7468	B21208	97	99	Nitrate	µg/kg	2,460	—	ND	52,000	No	No
F+G_Deep	C7468	B21208	97	99	Nitrite	µg/kg	457	—	ND	—	ND	No
F+G_Deep	C7468	B21208	97	99	Phosphorus	µg/kg	432,000	—	ND	—	ND	No
F+G_Deep	C7468	B21208	97	99	Strontium	µg/kg	35,800	6,758,400	No	—	ND	No
F+G_Deep	C7468	B21208	97	99	Sulfate	µg/kg	22,500	—	ND	237,000	No	No
F+G_Deep	C7468	B21208	97	99	Thallium	µg/kg	93.5	712	No	185	No	No
F+G_Deep	C7468	B21208	97	99	Vanadium	µg/kg	30,600	1,600,320	No	85,100	No	No
F+G_Deep	C7468	B21208	97	99	Zinc	µg/kg	29,300	5,971,200	No	67,800	No	No
F+G_Deep	C7468	B21210	97	99	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Deep	C7468	B21211	125	127	Aluminum	µg/kg	4,800,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7468	B21211	125	127	Arsenic	µg/kg	3,990	2,920	Yes	20,000	No	No
F+G_Deep	C7468	B21211	125	127	Barium	µg/kg	40,600	1,648,000	No	132,000	No	No
F+G_Deep	C7468	B21211	125	127	Bis(2-ethylhexyl) phthalate	µg/kg	714	13,359	No	—	ND	No
F+G_Deep	C7468	B21211	125	127	Chloride	µg/kg	3,200	—	ND	100,000	No	No
F+G_Deep	C7468	B21211	125	127	Chromium	µg/kg	9,630	480,096,000	No	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 23 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7468	B21211	125	127	Cobalt	µg/kg	3,900	4,339	No	15,700	No	No
F+G_Deep	C7468	B21211	125	127	Copper	µg/kg	7,580	284,160	No	22,000	No	No
F+G_Deep	C7468	B21211	125	127	Fluoride	µg/kg	1,020	2,883,840	No	2,810	No	No
F+G_Deep	C7468	B21211	125	127	Hexavalent Chromium	µg/kg	9,630	192	Yes	18,500	No	No
F+G_Deep	C7468	B21211	125	127	Iron	µg/kg	12,100,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7468	B21211	125	127	Lead	µg/kg	4,660	3,000,060	No	10,200	No	No
F+G_Deep	C7468	B21211	125	127	Lithium	µg/kg	7,300	192,128	No	13,300	No	No
F+G_Deep	C7468	B21211	125	127	Manganese	µg/kg	213,000	500,736	No	512,000	No	No
F+G_Deep	C7468	B21211	125	127	Nickel	µg/kg	9,860	130,400	No	19,100	No	No
F+G_Deep	C7468	B21211	125	127	Nitrate	µg/kg	192,000	—	ND	52,000	Yes	No
F+G_Deep	C7468	B21211	125	127	Nitrite	µg/kg	1,230	—	ND	—	ND	No
F+G_Deep	C7468	B21211	125	127	Phosphorus	µg/kg	443,000	—	ND	—	ND	No
F+G_Deep	C7468	B21211	125	127	Strontium	µg/kg	24,900	6,758,400	No	—	ND	No
F+G_Deep	C7468	B21211	125	127	Sulfate	µg/kg	90,200	—	ND	237,000	No	No
F+G_Deep	C7468	B21211	125	127	Thallium	µg/kg	61.6	712	No	185	No	No
F+G_Deep	C7468	B21211	125	127	Vanadium	µg/kg	25,400	1,600,320	No	85,100	No	No
F+G_Deep	C7468	B21211	125	127	Zinc	µg/kg	25,600	5,971,200	No	67,800	No	No
F+G_Deep	C7468	B21214	135	137	Aluminum	µg/kg	5,800,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7468	B21214	135	137	Arsenic	µg/kg	2,150	2,920	No	20,000	No	No
F+G_Deep	C7468	B21214	135	137	Barium	µg/kg	61,500	1,648,000	No	132,000	No	No
F+G_Deep	C7468	B21214	135	137	Bis(2-ethylhexyl) phthalate	µg/kg	1,770	13,359	No	—	ND	No
F+G_Deep	C7468	B21214	135	137	Chloride	µg/kg	3,180	—	ND	100,000	No	No
F+G_Deep	C7468	B21214	135	137	Chromium	µg/kg	9,900	480,096,000	No	18,500	No	No
F+G_Deep	C7468	B21214	135	137	Cobalt	µg/kg	5,190	4,339	Yes	15,700	No	No
F+G_Deep	C7468	B21214	135	137	Copper	µg/kg	6,680	284,160	No	22,000	No	No
F+G_Deep	C7468	B21214	135	137	Fluoride	µg/kg	1,090	2,883,840	No	2,810	No	No
F+G_Deep	C7468	B21214	135	137	Hexavalent Chromium	µg/kg	9,900	192	Yes	18,500	No	No
F+G_Deep	C7468	B21214	135	137	Iron	µg/kg	13,000,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7468	B21214	135	137	Lead	µg/kg	3,680	3,000,060	No	10,200	No	No
F+G_Deep	C7468	B21214	135	137	Lithium	µg/kg	8,170	192,128	No	13,300	No	No
F+G_Deep	C7468	B21214	135	137	Manganese	µg/kg	223,000	500,736	No	512,000	No	No
F+G_Deep	C7468	B21214	135	137	Nickel	µg/kg	12,000	130,400	No	19,100	No	No
F+G_Deep	C7468	B21214	135	137	Nitrate	µg/kg	173,000	—	ND	52,000	Yes	No
F+G_Deep	C7468	B21214	135	137	Nitrite	µg/kg	1,620	—	ND	—	ND	No
F+G_Deep	C7468	B21214	135	137	Phosphorus	µg/kg	555,000	—	ND	—	ND	No
F+G_Deep	C7468	B21214	135	137	Strontium	µg/kg	30,500	6,758,400	No	—	ND	No
F+G_Deep	C7468	B21214	135	137	Sulfate	µg/kg	126,000	—	ND	237,000	No	No
F+G_Deep	C7468	B21214	135	137	Thallium	µg/kg	73.9	712	No	185	No	No
F+G_Deep	C7468	B21214	135	137	Vanadium	µg/kg	24,400	1,600,320	No	85,100	No	No
F+G_Deep	C7468	B21214	135	137	Zinc	µg/kg	27,200	5,971,200	No	67,800	No	No
F+G_Deep	C7468	B21216	135	137	Methylene chloride	µg/kg	2.8	22	No	—	ND	No
F+G_Deep	C7468	B21216	135	137	Styrene	µg/kg	0.609	2,244	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 24 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7472	B238H4	108.5	110.5	Aluminum	µg/kg	7,350,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Antimony	µg/kg	240	5,424	No	130	Yes	No
F+G_Deep	C7472	B238H4	108.5	110.5	Arsenic	µg/kg	2,590	2,920	No	20,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Barium	µg/kg	64,700	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Cadmium	µg/kg	53.7	690	No	563	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Chloride	µg/kg	1,930	—	ND	100,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Chromium	µg/kg	14,700	480,096,000	No	18,500	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Cobalt	µg/kg	5,050	4,339	Yes	15,700	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Copper	µg/kg	9,120	284,160	No	22,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Fluoride	µg/kg	807	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Hexavalent Chromium	µg/kg	14,700	192	Yes	18,500	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Iron	µg/kg	15,100,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Lithium	µg/kg	10,500	192,128	No	13,300	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Manganese	µg/kg	263,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Nickel	µg/kg	16,000	130,400	No	19,100	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Nitrate	µg/kg	9,060	—	ND	52,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Nitrite	µg/kg	3,210	—	ND	—	ND	No
F+G_Deep	C7472	B238H4	108.5	110.5	Phosphorus	µg/kg	471,000	—	ND	—	ND	No
F+G_Deep	C7472	B238H4	108.5	110.5	Strontium	µg/kg	33,300	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238H4	108.5	110.5	Sulfate	µg/kg	37,200	—	ND	237,000	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Vanadium	µg/kg	30,200	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238H4	108.5	110.5	Zinc	µg/kg	32,600	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B238H6	108.5	110.5	2-Butanone	µg/kg	2.22	19,652	No	—	ND	No
F+G_Deep	C7472	B238H6	108.5	110.5	4-Methyl-2-pentanone	µg/kg	2.04	2,728	No	—	ND	No
F+G_Deep	C7472	B238H6	108.5	110.5	Toluene	µg/kg	0.223	4,654	No	—	ND	No
F+G_Deep	C7472	B238H7	129	131	Aluminum	µg/kg	6,580,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238H7	129	131	Antimony	µg/kg	186	5,424	No	130	Yes	No
F+G_Deep	C7472	B238H7	129	131	Arsenic	µg/kg	2,360	2,920	No	20,000	No	No
F+G_Deep	C7472	B238H7	129	131	Barium	µg/kg	49,000	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238H7	129	131	Cadmium	µg/kg	51.8	690	No	563	No	No
F+G_Deep	C7472	B238H7	129	131	Chloride	µg/kg	1,020	—	ND	100,000	No	No
F+G_Deep	C7472	B238H7	129	131	Chromium	µg/kg	10,800	480,096,000	No	18,500	No	No
F+G_Deep	C7472	B238H7	129	131	Cobalt	µg/kg	4,150	4,339	No	15,700	No	No
F+G_Deep	C7472	B238H7	129	131	Copper	µg/kg	8,620	284,160	No	22,000	No	No
F+G_Deep	C7472	B238H7	129	131	Fluoride	µg/kg	459	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238H7	129	131	Hexavalent Chromium	µg/kg	10,800	192	Yes	18,500	No	No
F+G_Deep	C7472	B238H7	129	131	Iron	µg/kg	13,700,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238H7	129	131	Lithium	µg/kg	9,600	192,128	No	13,300	No	No
F+G_Deep	C7472	B238H7	129	131	Manganese	µg/kg	229,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238H7	129	131	Nickel	µg/kg	13,000	130,400	No	19,100	No	No
F+G_Deep	C7472	B238H7	129	131	Nitrate	µg/kg	5,640	—	ND	52,000	No	No
F+G_Deep	C7472	B238H7	129	131	Nitrite	µg/kg	1,890	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 25 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7472	B238H7	129	131	Phosphorus	µg/kg	426,000	—	ND	—	ND	No
F+G_Deep	C7472	B238H7	129	131	Strontium	µg/kg	32,400	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238H7	129	131	Sulfate	µg/kg	23,800	—	ND	237,000	No	No
F+G_Deep	C7472	B238H7	129	131	Vanadium	µg/kg	29,300	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238H7	129	131	Zinc	µg/kg	27,300	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B238H9	129	131	2-Butanone	µg/kg	2.55	19,652	No	—	ND	No
F+G_Deep	C7472	B238H9	129	131	4-Methyl-2-pentanone	µg/kg	2.03	2,728	No	—	ND	No
F+G_Deep	C7472	B238H9	129	131	Toluene	µg/kg	0.233	4,654	No	—	ND	No
F+G_Deep	C7472	B238J0	142	144	Aluminum	µg/kg	6,140,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238J0	142	144	Arsenic	µg/kg	3,180	2,920	Yes	20,000	No	No
F+G_Deep	C7472	B238J0	142	144	Barium	µg/kg	58,700	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238J0	142	144	Cadmium	µg/kg	58.7	690	No	563	No	No
F+G_Deep	C7472	B238J0	142	144	Chloride	µg/kg	1,520	—	ND	100,000	No	No
F+G_Deep	C7472	B238J0	142	144	Chromium	µg/kg	18,600	480,096,000	No	18,500	Yes	No
F+G_Deep	C7472	B238J0	142	144	Cobalt	µg/kg	5,260	4,339	Yes	15,700	No	No
F+G_Deep	C7472	B238J0	142	144	Copper	µg/kg	8,880	284,160	No	22,000	No	No
F+G_Deep	C7472	B238J0	142	144	Fluoride	µg/kg	717	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238J0	142	144	Hexavalent Chromium	µg/kg	18,600	192	Yes	18,500	Yes	Yes
F+G_Deep	C7472	B238J0	142	144	Iron	µg/kg	15,400,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238J0	142	144	Lithium	µg/kg	9,210	192,128	No	13,300	No	No
F+G_Deep	C7472	B238J0	142	144	Manganese	µg/kg	244,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238J0	142	144	Nickel	µg/kg	14,200	130,400	No	19,100	No	No
F+G_Deep	C7472	B238J0	142	144	Nitrate	µg/kg	3,070	—	ND	52,000	No	No
F+G_Deep	C7472	B238J0	142	144	Nitrite	µg/kg	2,140	—	ND	—	ND	No
F+G_Deep	C7472	B238J0	142	144	Phosphorus	µg/kg	488,000	—	ND	—	ND	No
F+G_Deep	C7472	B238J0	142	144	Strontium	µg/kg	27,700	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238J0	142	144	Sulfate	µg/kg	24,800	—	ND	237,000	No	No
F+G_Deep	C7472	B238J0	142	144	Vanadium	µg/kg	29,700	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238J0	142	144	Zinc	µg/kg	29,700	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B238J2	142	144	Toluene	µg/kg	0.202	4,654	No	—	ND	No
F+G_Deep	C7472	B238J3	158	160	Aluminum	µg/kg	6,550,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238J3	158	160	Arsenic	µg/kg	2,320	2,920	No	20,000	No	No
F+G_Deep	C7472	B238J3	158	160	Barium	µg/kg	57,800	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238J3	158	160	Cadmium	µg/kg	47.2	690	No	563	No	No
F+G_Deep	C7472	B238J3	158	160	Chloride	µg/kg	2,570	—	ND	100,000	No	No
F+G_Deep	C7472	B238J3	158	160	Chromium	µg/kg	19,200	480,096,000	No	18,500	Yes	No
F+G_Deep	C7472	B238J3	158	160	Cobalt	µg/kg	6,100	4,339	Yes	15,700	No	No
F+G_Deep	C7472	B238J3	158	160	Copper	µg/kg	10,300	284,160	No	22,000	No	No
F+G_Deep	C7472	B238J3	158	160	Fluoride	µg/kg	651	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238J3	158	160	Hexavalent Chromium	µg/kg	19,200	192	Yes	18,500	Yes	Yes
F+G_Deep	C7472	B238J3	158	160	Iron	µg/kg	15,400,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238J3	158	160	Lithium	µg/kg	9,160	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 26 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7472	B238J3	158	160	Manganese	µg/kg	254,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238J3	158	160	Nickel	µg/kg	17,600	130,400	No	19,100	No	No
F+G_Deep	C7472	B238J3	158	160	Nitrate	µg/kg	2,450	—	ND	52,000	No	No
F+G_Deep	C7472	B238J3	158	160	Nitrite	µg/kg	2,120	—	ND	—	ND	No
F+G_Deep	C7472	B238J3	158	160	Phosphorus	µg/kg	517,000	—	ND	—	ND	No
F+G_Deep	C7472	B238J3	158	160	Strontium	µg/kg	32,800	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238J3	158	160	Sulfate	µg/kg	31,500	—	ND	237,000	No	No
F+G_Deep	C7472	B238J3	158	160	Vanadium	µg/kg	33,900	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238J3	158	160	Zinc	µg/kg	29,800	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B238J5	158	160	Toluene	µg/kg	0.161	4,654	No	—	ND	No
F+G_Deep	C7472	B238J6	195	197	Aluminum	µg/kg	5,040,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238J6	195	197	Arsenic	µg/kg	1,700	2,920	No	20,000	No	No
F+G_Deep	C7472	B238J6	195	197	Barium	µg/kg	54,000	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238J6	195	197	Cadmium	µg/kg	89.7	690	No	563	No	No
F+G_Deep	C7472	B238J6	195	197	Chloride	µg/kg	3,020	—	ND	100,000	No	No
F+G_Deep	C7472	B238J6	195	197	Chromium	µg/kg	15,200	480,096,000	No	18,500	No	No
F+G_Deep	C7472	B238J6	195	197	Cobalt	µg/kg	6,860	4,339	Yes	15,700	No	No
F+G_Deep	C7472	B238J6	195	197	Copper	µg/kg	14,600	284,160	No	22,000	No	No
F+G_Deep	C7472	B238J6	195	197	Fluoride	µg/kg	724	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238J6	195	197	Hexavalent Chromium	µg/kg	15,200	192	Yes	18,500	No	No
F+G_Deep	C7472	B238J6	195	197	Iron	µg/kg	17,700,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238J6	195	197	Lithium	µg/kg	6,820	192,128	No	13,300	No	No
F+G_Deep	C7472	B238J6	195	197	Manganese	µg/kg	226,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238J6	195	197	Nickel	µg/kg	13,400	130,400	No	19,100	No	No
F+G_Deep	C7472	B238J6	195	197	Nitrate	µg/kg	8,080	—	ND	52,000	No	No
F+G_Deep	C7472	B238J6	195	197	Nitrite	µg/kg	3,540	—	ND	—	ND	No
F+G_Deep	C7472	B238J6	195	197	Phosphorus	µg/kg	659,000	—	ND	—	ND	No
F+G_Deep	C7472	B238J6	195	197	Silver	µg/kg	72.2	13,600	No	167	No	No
F+G_Deep	C7472	B238J6	195	197	Strontium	µg/kg	24,100	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238J6	195	197	Sulfate	µg/kg	53,600	—	ND	237,000	No	No
F+G_Deep	C7472	B238J6	195	197	Vanadium	µg/kg	43,300	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238J6	195	197	Zinc	µg/kg	30,800	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B238J8	195	197	Toluene	µg/kg	0.215	4,654	No	—	ND	No
F+G_Deep	C7472	B238K3	216	218	Aluminum	µg/kg	6,300,000	480,064,000	No	11,800,000	No	No
F+G_Deep	C7472	B238K3	216	218	Arsenic	µg/kg	1,880	2,920	No	20,000	No	No
F+G_Deep	C7472	B238K3	216	218	Barium	µg/kg	64,600	1,648,000	No	132,000	No	No
F+G_Deep	C7472	B238K3	216	218	Beryllium	µg/kg	181	63,216	No	1,510	No	No
F+G_Deep	C7472	B238K3	216	218	Cadmium	µg/kg	67.9	690	No	563	No	No
F+G_Deep	C7472	B238K3	216	218	Chloride	µg/kg	2,860	—	ND	100,000	No	No
F+G_Deep	C7472	B238K3	216	218	Chromium	µg/kg	22,100	480,096,000	No	18,500	Yes	No
F+G_Deep	C7472	B238K3	216	218	Cobalt	µg/kg	5,350	4,339	Yes	15,700	No	No
F+G_Deep	C7472	B238K3	216	218	Copper	µg/kg	10,900	284,160	No	22,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 27 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Deep	C7472	B238K3	216	218	Fluoride	µg/kg	812	2,883,840	No	2,810	No	No
F+G_Deep	C7472	B238K3	216	218	Hexavalent Chromium	µg/kg	22,100	192	Yes	18,500	Yes	Yes
F+G_Deep	C7472	B238K3	216	218	Iron	µg/kg	15,500,000	5,644,800	Yes	32,600,000	No	No
F+G_Deep	C7472	B238K3	216	218	Lead	µg/kg	9,720	3,000,060	No	10,200	No	No
F+G_Deep	C7472	B238K3	216	218	Lithium	µg/kg	7,700	192,128	No	13,300	No	No
F+G_Deep	C7472	B238K3	216	218	Manganese	µg/kg	261,000	500,736	No	512,000	No	No
F+G_Deep	C7472	B238K3	216	218	Molybdenum	µg/kg	2,110	32,320	No	470	Yes	No
F+G_Deep	C7472	B238K3	216	218	Nickel	µg/kg	11,300	130,400	No	19,100	No	No
F+G_Deep	C7472	B238K3	216	218	Nitrate	µg/kg	5,150	—	ND	52,000	No	No
F+G_Deep	C7472	B238K3	216	218	Phosphorus	µg/kg	456,000	—	ND	—	ND	No
F+G_Deep	C7472	B238K3	216	218	Silver	µg/kg	82.7	13,600	No	167	No	No
F+G_Deep	C7472	B238K3	216	218	Strontium	µg/kg	29,400	6,758,400	No	—	ND	No
F+G_Deep	C7472	B238K3	216	218	Sulfate	µg/kg	31,600	—	ND	237,000	No	No
F+G_Deep	C7472	B238K3	216	218	Vanadium	µg/kg	30,900	1,600,320	No	85,100	No	No
F+G_Deep	C7472	B238K3	216	218	Zinc	µg/kg	29,300	5,971,200	No	67,800	No	No
F+G_Deep	C7472	B23K86	216	218	2-Butanone	µg/kg	3.18	19,652	No	—	ND	No
F+G_Deep	C7472	B23K86	216	218	2-Hexanone	µg/kg	4.24	172	No	—	ND	No
F+G_Deep	C7472	B23K86	216	218	Toluene	µg/kg	0.278	4,654	No	—	ND	No
F+G_Shallow	C7468	B211Y3	5	7	Aluminum	µg/kg	6,030,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Arsenic	µg/kg	3,480	2,920	Yes	20,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Barium	µg/kg	68,700	1,648,000	No	132,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	beta-BHC	µg/kg	25	2.3	Yes	—	ND	Yes
F+G_Shallow	C7468	B211Y3	5	7	Bis(2-ethylhexyl) phthalate	µg/kg	1,790	13,359	No	—	ND	No
F+G_Shallow	C7468	B211Y3	5	7	Cadmium	µg/kg	119	690	No	563	No	No
F+G_Shallow	C7468	B211Y3	5	7	Chloride	µg/kg	545	—	ND	100,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Chromium	µg/kg	8,230	480,096,000	No	18,500	No	No
F+G_Shallow	C7468	B211Y3	5	7	Cobalt	µg/kg	6,610	4,339	Yes	15,700	No	No
F+G_Shallow	C7468	B211Y3	5	7	Copper	µg/kg	11,400	284,160	No	22,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Fluoride	µg/kg	1,220	2,883,840	No	2,810	No	No
F+G_Shallow	C7468	B211Y3	5	7	Hexavalent Chromium	µg/kg	8,230	192	Yes	18,500	No	No
F+G_Shallow	C7468	B211Y3	5	7	Iron	µg/kg	17,300,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Lead	µg/kg	4,400	3,000,060	No	10,200	No	No
F+G_Shallow	C7468	B211Y3	5	7	Lithium	µg/kg	7,690	192,128	No	13,300	No	No
F+G_Shallow	C7468	B211Y3	5	7	Manganese	µg/kg	259,000	500,736	No	512,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Nickel	µg/kg	9,050	130,400	No	19,100	No	No
F+G_Shallow	C7468	B211Y3	5	7	Nitrate	µg/kg	4,680	—	ND	52,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Nitrite	µg/kg	3,010	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y3	5	7	Phosphorus	µg/kg	615,000	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y3	5	7	Strontium	µg/kg	24,900	6,758,400	No	—	ND	No
F+G_Shallow	C7468	B211Y3	5	7	Sulfate	µg/kg	4,360	—	ND	237,000	No	No
F+G_Shallow	C7468	B211Y3	5	7	Thallium	µg/kg	83.4	712	No	185	No	No
F+G_Shallow	C7468	B211Y3	5	7	Vanadium	µg/kg	47,200	1,600,320	No	85,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 28 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Shallow	C7468	B211Y3	5	7	Zinc	µg/kg	35,500	5,971,200	No	67,800	No	No
F+G_Shallow	C7468	B211Y5	5	7	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Shallow	C7468	B211Y5	5	7	Styrene	µg/kg	0.654	2,244	No	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Aluminum	µg/kg	5,190,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Aroclor-1260	µg/kg	20.6	7,198	No	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Arsenic	µg/kg	2,070	2,920	No	20,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Barium	µg/kg	40,600	1,648,000	No	132,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	beta-BHC	µg/kg	21	2.3	Yes	—	ND	Yes
F+G_Shallow	C7468	B211Y6	10	12	Bis(2-ethylhexyl) phthalate	µg/kg	2,840	13,359	No	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Chloride	µg/kg	416	—	ND	100,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Chromium	µg/kg	9,500	480,096,000	No	18,500	No	No
F+G_Shallow	C7468	B211Y6	10	12	Cobalt	µg/kg	5,360	4,339	Yes	15,700	No	No
F+G_Shallow	C7468	B211Y6	10	12	Copper	µg/kg	10,700	284,160	No	22,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Fluoride	µg/kg	695	2,883,840	No	2,810	No	No
F+G_Shallow	C7468	B211Y6	10	12	Hexavalent Chromium	µg/kg	9,500	192	Yes	18,500	No	No
F+G_Shallow	C7468	B211Y6	10	12	Iron	µg/kg	15,200,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Lead	µg/kg	3,370	3,000,060	No	10,200	No	No
F+G_Shallow	C7468	B211Y6	10	12	Lithium	µg/kg	6,660	192,128	No	13,300	No	No
F+G_Shallow	C7468	B211Y6	10	12	Manganese	µg/kg	229,000	500,736	No	512,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Nickel	µg/kg	9,010	130,400	No	19,100	No	No
F+G_Shallow	C7468	B211Y6	10	12	Nitrate	µg/kg	3,250	—	ND	52,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Nitrite	µg/kg	2,110	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Phosphorus	µg/kg	550,000	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Strontium	µg/kg	25,700	6,758,400	No	—	ND	No
F+G_Shallow	C7468	B211Y6	10	12	Sulfate	µg/kg	7,730	—	ND	237,000	No	No
F+G_Shallow	C7468	B211Y6	10	12	Vanadium	µg/kg	40,900	1,600,320	No	85,100	No	No
F+G_Shallow	C7468	B211Y6	10	12	Zinc	µg/kg	28,500	5,971,200	No	67,800	No	No
F+G_Shallow	C7468	B211Y8	10	12	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Shallow	C7468	B211Y8	10	12	Styrene	µg/kg	0.245	2,244	No	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Aluminum	µg/kg	4,480,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Arsenic	µg/kg	1,920	2,920	No	20,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Barium	µg/kg	75,400	1,648,000	No	132,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	beta-BHC	µg/kg	23	2.3	Yes	—	ND	Yes
F+G_Shallow	C7468	B211Y9	14	16	Bis(2-ethylhexyl) phthalate	µg/kg	7,420	13,359	No	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Chloride	µg/kg	1,080	—	ND	100,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Chromium	µg/kg	4,740	480,096,000	No	18,500	No	No
F+G_Shallow	C7468	B211Y9	14	16	Cobalt	µg/kg	7,760	4,339	Yes	15,700	No	No
F+G_Shallow	C7468	B211Y9	14	16	Copper	µg/kg	10,100	284,160	No	22,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Fluoride	µg/kg	1,090	2,883,840	No	2,810	No	No
F+G_Shallow	C7468	B211Y9	14	16	Gamma-BHC (Lindane)	µg/kg	5.1	6.2	No	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Hexavalent Chromium	µg/kg	4,740	192	Yes	18,500	No	No
F+G_Shallow	C7468	B211Y9	14	16	Iron	µg/kg	23,900,000	5,644,800	Yes	32,600,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 29 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Shallow	C7468	B211Y9	14	16	Lead	µg/kg	3,410	3,000,060	No	10,200	No	No
F+G_Shallow	C7468	B211Y9	14	16	Lithium	µg/kg	3,350	192,128	No	13,300	No	No
F+G_Shallow	C7468	B211Y9	14	16	Manganese	µg/kg	302,000	500,736	No	512,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Nickel	µg/kg	6,400	130,400	No	19,100	No	No
F+G_Shallow	C7468	B211Y9	14	16	Nitrate	µg/kg	4,750	—	ND	52,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Nitrite	µg/kg	1,470	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Phosphorus	µg/kg	947,000	—	ND	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Strontium	µg/kg	21,700	6,758,400	No	—	ND	No
F+G_Shallow	C7468	B211Y9	14	16	Sulfate	µg/kg	8,100	—	ND	237,000	No	No
F+G_Shallow	C7468	B211Y9	14	16	Thallium	µg/kg	75.2	712	No	185	No	No
F+G_Shallow	C7468	B211Y9	14	16	Vanadium	µg/kg	78,500	1,600,320	No	85,100	No	No
F+G_Shallow	C7468	B211Y9	14	16	Zinc	µg/kg	34,900	5,971,200	No	67,800	No	No
F+G_Shallow	C7468	B21201	14	16	Styrene	µg/kg	0.251	2,244	No	—	ND	No
F+G_Shallow	C7468	B21222	0	1	Methylene chloride	µg/kg	2	22	No	—	ND	No
F+G_Shallow	C7468	B21222	0	1	Styrene	µg/kg	0.311	2,244	No	—	ND	No
F+G_Shallow	C7468	B215L0	0	1	Antimony	µg/kg	182	5,424	No	130	Yes	No
F+G_Shallow	C7468	B215L0	0	1	Arsenic	µg/kg	3,410	2,920	Yes	20,000	No	No
F+G_Shallow	C7468	B215L0	0	1	Beryllium	µg/kg	298	63,216	No	1,510	No	No
F+G_Shallow	C7468	B215L0	0	1	beta-BHC	µg/kg	25	2.3	Yes	—	ND	Yes
F+G_Shallow	C7468	B215L0	0	1	Cadmium	µg/kg	143	690	No	563	No	No
F+G_Shallow	C7468	B215L0	0	1	Cobalt	µg/kg	8,760	4,339	Yes	15,700	No	No
F+G_Shallow	C7468	B215L0	0	1	Iron	µg/kg	24,400,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7468	B215L0	0	1	Phosphorus	µg/kg	1,010,000	—	ND	—	ND	No
F+G_Shallow	C7468	B215L1	0	1	Aluminum	µg/kg	7,000,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Barium	µg/kg	129,000	1,648,000	No	132,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Chloride	µg/kg	539	—	ND	100,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Chromium	µg/kg	8,190	480,096,000	No	18,500	No	No
F+G_Shallow	C7468	B215L1	0	1	Copper	µg/kg	11,000	284,160	No	22,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Fluoride	µg/kg	1,070	2,883,840	No	2,810	No	No
F+G_Shallow	C7468	B215L1	0	1	Hexavalent Chromium	µg/kg	8,190	192	Yes	18,500	No	No
F+G_Shallow	C7468	B215L1	0	1	Lead	µg/kg	6,200	3,000,060	No	10,200	No	No
F+G_Shallow	C7468	B215L1	0	1	Lithium	µg/kg	7,800	192,128	No	13,300	No	No
F+G_Shallow	C7468	B215L1	0	1	Manganese	µg/kg	500,000	500,736	No	512,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Nickel	µg/kg	12,400	130,400	No	19,100	No	No
F+G_Shallow	C7468	B215L1	0	1	Nitrate	µg/kg	5,340	—	ND	52,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Nitrite	µg/kg	4,080	—	ND	—	ND	No
F+G_Shallow	C7468	B215L1	0	1	Strontium	µg/kg	30,700	6,758,400	No	—	ND	No
F+G_Shallow	C7468	B215L1	0	1	Sulfate	µg/kg	2,940	—	ND	237,000	No	No
F+G_Shallow	C7468	B215L1	0	1	Thallium	µg/kg	113	712	No	185	No	No
F+G_Shallow	C7468	B215L1	0	1	Tin	µg/kg	6,360	48,038,400	No	—	ND	No
F+G_Shallow	C7468	B215L1	0	1	Vanadium	µg/kg	68,500	1,600,320	No	85,100	No	No
F+G_Shallow	C7468	B215L1	0	1	Zinc	µg/kg	43,100	5,971,200	No	67,800	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 30 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Shallow	C7472	B236N5	0	1	Aluminum	µg/kg	6,460,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Antimony	µg/kg	245	5,424	No	130	Yes	No
F+G_Shallow	C7472	B236N5	0	1	Arsenic	µg/kg	3,420	2,920	Yes	20,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Barium	µg/kg	64,300	1,648,000	No	132,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Beryllium	µg/kg	211	63,216	No	1,510	No	No
F+G_Shallow	C7472	B236N5	0	1	Cadmium	µg/kg	90.2	690	No	563	No	No
F+G_Shallow	C7472	B236N5	0	1	Chloride	µg/kg	445	—	ND	100,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Chromium	µg/kg	6,480	480,096,000	No	18,500	No	No
F+G_Shallow	C7472	B236N5	0	1	Cobalt	µg/kg	8,740	4,339	Yes	15,700	No	No
F+G_Shallow	C7472	B236N5	0	1	Copper	µg/kg	12,800	284,160	No	22,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Hexavalent Chromium	µg/kg	6,480	192	Yes	18,500	No	No
F+G_Shallow	C7472	B236N5	0	1	Iron	µg/kg	21,500,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Lithium	µg/kg	6,090	192,128	No	13,300	No	No
F+G_Shallow	C7472	B236N5	0	1	Manganese	µg/kg	316,000	500,736	No	512,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Mercury	µg/kg	30.4	2,090	No	13.1	Yes	No
F+G_Shallow	C7472	B236N5	0	1	Nickel	µg/kg	11,900	130,400	No	19,100	No	No
F+G_Shallow	C7472	B236N5	0	1	Nitrate	µg/kg	4,670	—	ND	52,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Nitrite	µg/kg	2,340	—	ND	—	ND	No
F+G_Shallow	C7472	B236N5	0	1	Phosphorus	µg/kg	1,020,000	—	ND	—	ND	No
F+G_Shallow	C7472	B236N5	0	1	Strontium	µg/kg	28,400	6,758,400	No	—	ND	No
F+G_Shallow	C7472	B236N5	0	1	Sulfate	µg/kg	3,130	—	ND	237,000	No	No
F+G_Shallow	C7472	B236N5	0	1	Thallium	µg/kg	88.6	712	No	185	No	No
F+G_Shallow	C7472	B236N5	0	1	Vanadium	µg/kg	41,800	1,600,320	No	85,100	No	No
F+G_Shallow	C7472	B236N5	0	1	Zinc	µg/kg	38,200	5,971,200	No	67,800	No	No
F+G_Shallow	C7472	B236N8	0	1	Fluoride	µg/kg	832	2,883,840	No	2,810	No	No
F+G_Shallow	C7472	B236N8	0	1	Lead	µg/kg	8,480	3,000,060	No	10,200	No	No
F+G_Shallow	C7472	B236P2	5	7	Aluminum	µg/kg	6,500,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Antimony	µg/kg	262	5,424	No	130	Yes	No
F+G_Shallow	C7472	B236P2	5	7	Arsenic	µg/kg	4,300	2,920	Yes	20,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Barium	µg/kg	71,900	1,648,000	No	132,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Beryllium	µg/kg	185	63,216	No	1,510	No	No
F+G_Shallow	C7472	B236P2	5	7	Butylbenzylphthalate	µg/kg	48.8	12,845	No	—	ND	No
F+G_Shallow	C7472	B236P2	5	7	Cadmium	µg/kg	116	690	No	563	No	No
F+G_Shallow	C7472	B236P2	5	7	Chloride	µg/kg	790	—	ND	100,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Chromium	µg/kg	9,120	480,096,000	No	18,500	No	No
F+G_Shallow	C7472	B236P2	5	7	Cobalt	µg/kg	6,040	4,339	Yes	15,700	No	No
F+G_Shallow	C7472	B236P2	5	7	Copper	µg/kg	12,200	284,160	No	22,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Fluoride	µg/kg	3,290	2,883,840	No	2,810	Yes	No
F+G_Shallow	C7472	B236P2	5	7	Hexavalent Chromium	µg/kg	9,120	192	Yes	18,500	No	No
F+G_Shallow	C7472	B236P2	5	7	Iron	µg/kg	16,500,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Lead	µg/kg	6,030	3,000,060	No	10,200	No	No
F+G_Shallow	C7472	B236P2	5	7	Lithium	µg/kg	7,910	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 31 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Shallow	C7472	B236P2	5	7	Manganese	µg/kg	286,000	500,736	No	512,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Nickel	µg/kg	11,700	130,400	No	19,100	No	No
F+G_Shallow	C7472	B236P2	5	7	Nitrate	µg/kg	11,400	—	ND	52,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Nitrite	µg/kg	1,580	—	ND	—	ND	No
F+G_Shallow	C7472	B236P2	5	7	Phosphorus	µg/kg	786,000	—	ND	—	ND	No
F+G_Shallow	C7472	B236P2	5	7	Strontium	µg/kg	49,700	6,758,400	No	—	ND	No
F+G_Shallow	C7472	B236P2	5	7	Sulfate	µg/kg	11,700	—	ND	237,000	No	No
F+G_Shallow	C7472	B236P2	5	7	Thallium	µg/kg	84.6	712	No	185	No	No
F+G_Shallow	C7472	B236P2	5	7	Vanadium	µg/kg	31,600	1,600,320	No	85,100	No	No
F+G_Shallow	C7472	B236P2	5	7	Zinc	µg/kg	33,400	5,971,200	No	67,800	No	No
F+G_Shallow	C7472	B236P4	5	7	o-Xylene	µg/kg	0.128	14,703	No	—	ND	No
F+G_Shallow	C7472	B236P4	5	7	Toluene	µg/kg	0.978	4,654	No	—	ND	No
F+G_Shallow	C7472	B236P4	5	7	Xylenes (total)	µg/kg	0.463	14,630	No	—	ND	No
F+G_Shallow	C7472	B236P7	10	12	2-Butanone	µg/kg	2.5	19,652	No	—	ND	No
F+G_Shallow	C7472	B236P7	10	12	Toluene	µg/kg	0.246	4,654	No	—	ND	No
F+G_Shallow	C7472	B238H1	14	16	Aluminum	µg/kg	7,440,000	480,064,000	No	11,800,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Antimony	µg/kg	120	5,424	No	130	No	No
F+G_Shallow	C7472	B238H1	14	16	Arsenic	µg/kg	2,300	2,920	No	20,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Barium	µg/kg	89,800	1,648,000	No	132,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Butylbenzylphthalate	µg/kg	72.6	12,845	No	—	ND	No
F+G_Shallow	C7472	B238H1	14	16	Cadmium	µg/kg	73.3	690	No	563	No	No
F+G_Shallow	C7472	B238H1	14	16	Chloride	µg/kg	775	—	ND	100,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Chromium	µg/kg	9,720	480,096,000	No	18,500	No	No
F+G_Shallow	C7472	B238H1	14	16	Cobalt	µg/kg	6,850	4,339	Yes	15,700	No	No
F+G_Shallow	C7472	B238H1	14	16	Copper	µg/kg	11,200	284,160	No	22,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Fluoride	µg/kg	1,650	2,883,840	No	2,810	No	No
F+G_Shallow	C7472	B238H1	14	16	Hexavalent Chromium	µg/kg	9,720	192	Yes	18,500	No	No
F+G_Shallow	C7472	B238H1	14	16	Iron	µg/kg	24,400,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Lithium	µg/kg	6,610	192,128	No	13,300	No	No
F+G_Shallow	C7472	B238H1	14	16	Manganese	µg/kg	384,000	500,736	No	512,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Nickel	µg/kg	10,400	130,400	No	19,100	No	No
F+G_Shallow	C7472	B238H1	14	16	Nitrate	µg/kg	4,090	—	ND	52,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Nitrite	µg/kg	1,180	—	ND	—	ND	No
F+G_Shallow	C7472	B238H1	14	16	Phosphorus	µg/kg	663,000	—	ND	—	ND	No
F+G_Shallow	C7472	B238H1	14	16	Silver	µg/kg	70.7	13,600	No	167	No	No
F+G_Shallow	C7472	B238H1	14	16	Strontium	µg/kg	34,800	6,758,400	No	—	ND	No
F+G_Shallow	C7472	B238H1	14	16	Sulfate	µg/kg	27,500	—	ND	237,000	No	No
F+G_Shallow	C7472	B238H1	14	16	Vanadium	µg/kg	70,700	1,600,320	No	85,100	No	No
F+G_Shallow	C7472	B238H1	14	16	Zinc	µg/kg	33,400	5,971,200	No	67,800	No	No
F+G_Shallow	C7472	B238H3	14	16	2-Butanone	µg/kg	2.47	19,652	No	—	ND	No
F+G_Shallow	C7472	B238H3	14	16	Toluene	µg/kg	0.238	4,654	No	—	ND	No
F+G_Shallow	C7472	B23KT4	10	14	Aluminum	µg/kg	5,860,000	480,064,000	No	11,800,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 32 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
F+G_Shallow	C7472	B23KT4	10	14	Arsenic	µg/kg	2,460	2,920	No	20,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Barium	µg/kg	78,000	1,648,000	No	132,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Bis(2-ethylhexyl) phthalate	µg/kg	667	13,359	No	—	ND	No
F+G_Shallow	C7472	B23KT4	10	14	Cadmium	µg/kg	74.5	690	No	563	No	No
F+G_Shallow	C7472	B23KT4	10	14	Chloride	µg/kg	491	—	ND	100,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Chromium	µg/kg	6,390	480,096,000	No	18,500	No	No
F+G_Shallow	C7472	B23KT4	10	14	Cobalt	µg/kg	8,420	4,339	Yes	15,700	No	No
F+G_Shallow	C7472	B23KT4	10	14	Copper	µg/kg	15,600	284,160	No	22,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Fluoride	µg/kg	1,740	2,883,840	No	2,810	No	No
F+G_Shallow	C7472	B23KT4	10	14	Hexavalent Chromium	µg/kg	6,390	192	Yes	18,500	No	No
F+G_Shallow	C7472	B23KT4	10	14	Iron	µg/kg	25,900,000	5,644,800	Yes	32,600,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Lithium	µg/kg	4,370	192,128	No	13,300	No	No
F+G_Shallow	C7472	B23KT4	10	14	Manganese	µg/kg	358,000	500,736	No	512,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Nickel	µg/kg	7,510	130,400	No	19,100	No	No
F+G_Shallow	C7472	B23KT4	10	14	Nitrate	µg/kg	4,470	—	ND	52,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Nitrite	µg/kg	3,300	—	ND	—	ND	No
F+G_Shallow	C7472	B23KT4	10	14	Phosphorus	µg/kg	911,000	—	ND	—	ND	No
F+G_Shallow	C7472	B23KT4	10	14	Silver	µg/kg	81.8	13,600	No	167	No	No
F+G_Shallow	C7472	B23KT4	10	14	Strontium	µg/kg	26,500	6,758,400	No	—	ND	No
F+G_Shallow	C7472	B23KT4	10	14	Sulfate	µg/kg	25,100	—	ND	237,000	No	No
F+G_Shallow	C7472	B23KT4	10	14	Vanadium	µg/kg	78,200	1,600,320	No	85,100	No	No
F+G_Shallow	C7472	B23KT4	10	14	Zinc	µg/kg	37,000	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C32	17	19	Aluminum	µg/kg	7,310,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7680	B26C32	17	19	Antimony	µg/kg	125	5,424	No	130	No	No
H+I_Deep	C7680	B26C32	17	19	Arsenic	µg/kg	2,900	2,920	No	20,000	No	No
H+I_Deep	C7680	B26C32	17	19	Barium	µg/kg	84,800	1,648,000	No	132,000	No	No
H+I_Deep	C7680	B26C32	17	19	Beryllium	µg/kg	161	63,216	No	1,510	No	No
H+I_Deep	C7680	B26C32	17	19	Cadmium	µg/kg	61.4	690	No	563	No	No
H+I_Deep	C7680	B26C32	17	19	Chloride	µg/kg	1,710	—	ND	100,000	No	No
H+I_Deep	C7680	B26C32	17	19	Chromium	µg/kg	22,800	480,096,000	No	18,500	Yes	No
H+I_Deep	C7680	B26C32	17	19	Cobalt	µg/kg	10,600	4,339	Yes	15,700	No	No
H+I_Deep	C7680	B26C32	17	19	Copper	µg/kg	10,600	284,160	No	22,000	No	No
H+I_Deep	C7680	B26C32	17	19	Fluoride	µg/kg	1,860	2,883,840	No	2,810	No	No
H+I_Deep	C7680	B26C32	17	19	Hexavalent Chromium	µg/kg	22,800	192	Yes	18,500	Yes	Yes
H+I_Deep	C7680	B26C32	17	19	Iron	µg/kg	24,900,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7680	B26C32	17	19	Lead	µg/kg	3,760	3,000,060	No	10,200	No	No
H+I_Deep	C7680	B26C32	17	19	Lithium	µg/kg	7,290	192,128	No	13,300	No	No
H+I_Deep	C7680	B26C32	17	19	Manganese	µg/kg	409,000	500,736	No	512,000	No	No
H+I_Deep	C7680	B26C32	17	19	Nickel	µg/kg	14,600	130,400	No	19,100	No	No
H+I_Deep	C7680	B26C32	17	19	Nitrate	µg/kg	7,060	—	ND	52,000	No	No
H+I_Deep	C7680	B26C32	17	19	Nitrite	µg/kg	684	—	ND	—	ND	No
H+I_Deep	C7680	B26C32	17	19	Phosphorus	µg/kg	673,000	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 33 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7680	B26C32	17	19	Selenium	µg/kg	540	5,200	No	780	No	No
H+I_Deep	C7680	B26C32	17	19	Silver	µg/kg	56.6	13,600	No	167	No	No
H+I_Deep	C7680	B26C32	17	19	Strontium	µg/kg	35,900	6,758,400	No	—	ND	No
H+I_Deep	C7680	B26C32	17	19	Sulfate	µg/kg	40,500	—	ND	237,000	No	No
H+I_Deep	C7680	B26C32	17	19	Thallium	µg/kg	81.9	712	No	185	No	No
H+I_Deep	C7680	B26C32	17	19	Vanadium	µg/kg	71,200	1,600,320	No	85,100	No	No
H+I_Deep	C7680	B26C32	17	19	Zinc	µg/kg	42,000	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C33	17	19	Styrene	µg/kg	0.354	2,244	No	—	ND	No
H+I_Deep	C7680	B26C33	17	19	Toluene	µg/kg	0.421	4,654	No	—	ND	No
H+I_Deep	C7680	B26C34	43	45	Aluminum	µg/kg	7,520,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7680	B26C34	43	45	Antimony	µg/kg	124	5,424	No	130	No	No
H+I_Deep	C7680	B26C34	43	45	Arsenic	µg/kg	2,850	2,920	No	20,000	No	No
H+I_Deep	C7680	B26C34	43	45	Barium	µg/kg	62,400	1,648,000	No	132,000	No	No
H+I_Deep	C7680	B26C34	43	45	Beryllium	µg/kg	171	63,216	No	1,510	No	No
H+I_Deep	C7680	B26C34	43	45	Cadmium	µg/kg	64.2	690	No	563	No	No
H+I_Deep	C7680	B26C34	43	45	Chloride	µg/kg	2,270	—	ND	100,000	No	No
H+I_Deep	C7680	B26C34	43	45	Chromium	µg/kg	21,500	480,096,000	No	18,500	Yes	No
H+I_Deep	C7680	B26C34	43	45	Cobalt	µg/kg	7,230	4,339	Yes	15,700	No	No
H+I_Deep	C7680	B26C34	43	45	Copper	µg/kg	12,300	284,160	No	22,000	No	No
H+I_Deep	C7680	B26C34	43	45	Fluoride	µg/kg	908	2,883,840	No	2,810	No	No
H+I_Deep	C7680	B26C34	43	45	Hexavalent Chromium	µg/kg	21,500	192	Yes	18,500	Yes	Yes
H+I_Deep	C7680	B26C34	43	45	Iron	µg/kg	19,100,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7680	B26C34	43	45	Lead	µg/kg	3,620	3,000,060	No	10,200	No	No
H+I_Deep	C7680	B26C34	43	45	Lithium	µg/kg	8,380	192,128	No	13,300	No	No
H+I_Deep	C7680	B26C34	43	45	Manganese	µg/kg	298,000	500,736	No	512,000	No	No
H+I_Deep	C7680	B26C34	43	45	Nickel	µg/kg	18,000	130,400	No	19,100	No	No
H+I_Deep	C7680	B26C34	43	45	Nitrate	µg/kg	9,550	—	ND	52,000	No	No
H+I_Deep	C7680	B26C34	43	45	Nitrite	µg/kg	715	—	ND	—	ND	No
H+I_Deep	C7680	B26C34	43	45	Phosphorus	µg/kg	640,000	—	ND	—	ND	No
H+I_Deep	C7680	B26C34	43	45	Selenium	µg/kg	467	5,200	No	780	No	No
H+I_Deep	C7680	B26C34	43	45	Silver	µg/kg	53.1	13,600	No	167	No	No
H+I_Deep	C7680	B26C34	43	45	Strontium	µg/kg	33,700	6,758,400	No	—	ND	No
H+I_Deep	C7680	B26C34	43	45	Sulfate	µg/kg	70,700	—	ND	237,000	No	No
H+I_Deep	C7680	B26C34	43	45	Thallium	µg/kg	70	712	No	185	No	No
H+I_Deep	C7680	B26C34	43	45	Vanadium	µg/kg	43,100	1,600,320	No	85,100	No	No
H+I_Deep	C7680	B26C34	43	45	Zinc	µg/kg	35,800	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C35	43	45	Styrene	µg/kg	0.34	2,244	No	—	ND	No
H+I_Deep	C7680	B26C35	43	45	Toluene	µg/kg	0.374	4,654	No	—	ND	No
H+I_Deep	C7680	B26C36	92	94	Aluminum	µg/kg	7,900,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7680	B26C36	92	94	Antimony	µg/kg	189	5,424	No	130	Yes	No
H+I_Deep	C7680	B26C36	92	94	Arsenic	µg/kg	4,520	2,920	Yes	20,000	No	No
H+I_Deep	C7680	B26C36	92	94	Barium	µg/kg	87,200	1,648,000	No	132,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 34 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7680	B26C36	92	94	Beryllium	µg/kg	215	63,216	No	1,510	No	No
H+I_Deep	C7680	B26C36	92	94	Bis(2-ethylhexyl) phthalate	µg/kg	1,010	13,359	No	—	ND	No
H+I_Deep	C7680	B26C36	92	94	Cadmium	µg/kg	58.2	690	No	563	No	No
H+I_Deep	C7680	B26C36	92	94	Chloride	µg/kg	2,080	—	ND	100,000	No	No
H+I_Deep	C7680	B26C36	92	94	Chromium	µg/kg	28,700	480,096,000	No	18,500	Yes	No
H+I_Deep	C7680	B26C36	92	94	Cobalt	µg/kg	6,650	4,339	Yes	15,700	No	No
H+I_Deep	C7680	B26C36	92	94	Copper	µg/kg	10,000	284,160	No	22,000	No	No
H+I_Deep	C7680	B26C36	92	94	Fluoride	µg/kg	733	2,883,840	No	2,810	No	No
H+I_Deep	C7680	B26C36	92	94	Hexavalent Chromium	µg/kg	28,700	192	Yes	18,500	Yes	Yes
H+I_Deep	C7680	B26C36	92	94	Iron	µg/kg	17,800,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7680	B26C36	92	94	Lead	µg/kg	3,740	3,000,060	No	10,200	No	No
H+I_Deep	C7680	B26C36	92	94	Lithium	µg/kg	10,500	192,128	No	13,300	No	No
H+I_Deep	C7680	B26C36	92	94	Manganese	µg/kg	332,000	500,736	No	512,000	No	No
H+I_Deep	C7680	B26C36	92	94	Nickel	µg/kg	18,200	130,400	No	19,100	No	No
H+I_Deep	C7680	B26C36	92	94	Nitrate	µg/kg	6,020	—	ND	52,000	No	No
H+I_Deep	C7680	B26C36	92	94	Nitrite	µg/kg	712	—	ND	—	ND	No
H+I_Deep	C7680	B26C36	92	94	Phosphorus	µg/kg	480,000	—	ND	—	ND	No
H+I_Deep	C7680	B26C36	92	94	Selenium	µg/kg	345	5,200	No	780	No	No
H+I_Deep	C7680	B26C36	92	94	Silver	µg/kg	46.1	13,600	No	167	No	No
H+I_Deep	C7680	B26C36	92	94	Strontium	µg/kg	37,700	6,758,400	No	—	ND	No
H+I_Deep	C7680	B26C36	92	94	Sulfate	µg/kg	64,900	—	ND	237,000	No	No
H+I_Deep	C7680	B26C36	92	94	Thallium	µg/kg	62.2	712	No	185	No	No
H+I_Deep	C7680	B26C36	92	94	Vanadium	µg/kg	35,600	1,600,320	No	85,100	No	No
H+I_Deep	C7680	B26C36	92	94	Zinc	µg/kg	38,600	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C38	116	118	Aluminum	µg/kg	6,180,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7680	B26C38	116	118	Antimony	µg/kg	157	5,424	No	130	Yes	No
H+I_Deep	C7680	B26C38	116	118	Arsenic	µg/kg	3,470	2,920	Yes	20,000	No	No
H+I_Deep	C7680	B26C38	116	118	Barium	µg/kg	58,600	1,648,000	No	132,000	No	No
H+I_Deep	C7680	B26C38	116	118	Beryllium	µg/kg	176	63,216	No	1,510	No	No
H+I_Deep	C7680	B26C38	116	118	Bis(2-ethylhexyl) phthalate	µg/kg	5,620	13,359	No	—	ND	No
H+I_Deep	C7680	B26C38	116	118	Cadmium	µg/kg	63.1	690	No	563	No	No
H+I_Deep	C7680	B26C38	116	118	Chloride	µg/kg	2,090	—	ND	100,000	No	No
H+I_Deep	C7680	B26C38	116	118	Chromium	µg/kg	17,300	480,096,000	No	18,500	No	No
H+I_Deep	C7680	B26C38	116	118	Cobalt	µg/kg	5,740	4,339	Yes	15,700	No	No
H+I_Deep	C7680	B26C38	116	118	Copper	µg/kg	9,040	284,160	No	22,000	No	No
H+I_Deep	C7680	B26C38	116	118	Fluoride	µg/kg	648	2,883,840	No	2,810	No	No
H+I_Deep	C7680	B26C38	116	118	Hexavalent Chromium	µg/kg	17,300	192	Yes	18,500	No	No
H+I_Deep	C7680	B26C38	116	118	Iron	µg/kg	16,000,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7680	B26C38	116	118	Lead	µg/kg	3,790	3,000,060	No	10,200	No	No
H+I_Deep	C7680	B26C38	116	118	Lithium	µg/kg	8,660	192,128	No	13,300	No	No
H+I_Deep	C7680	B26C38	116	118	Manganese	µg/kg	267,000	500,736	No	512,000	No	No
H+I_Deep	C7680	B26C38	116	118	Nickel	µg/kg	14,700	130,400	No	19,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 35 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7680	B26C38	116	118	Nitrate	µg/kg	5,900	—	ND	52,000	No	No
H+I_Deep	C7680	B26C38	116	118	Nitrite	µg/kg	437	—	ND	—	ND	No
H+I_Deep	C7680	B26C38	116	118	Phosphorus	µg/kg	483,000	—	ND	—	ND	No
H+I_Deep	C7680	B26C38	116	118	Selenium	µg/kg	469	5,200	No	780	No	No
H+I_Deep	C7680	B26C38	116	118	Silver	µg/kg	44.3	13,600	No	167	No	No
H+I_Deep	C7680	B26C38	116	118	Strontium	µg/kg	29,400	6,758,400	No	—	ND	No
H+I_Deep	C7680	B26C38	116	118	Sulfate	µg/kg	42,300	—	ND	237,000	No	No
H+I_Deep	C7680	B26C38	116	118	Thallium	µg/kg	54.1	712	No	185	No	No
H+I_Deep	C7680	B26C38	116	118	Vanadium	µg/kg	31,000	1,600,320	No	85,100	No	No
H+I_Deep	C7680	B26C38	116	118	Zinc	µg/kg	32,000	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C39	116	118	Styrene	µg/kg	0.302	2,244	No	—	ND	No
H+I_Deep	C7680	B26C39	116	118	Toluene	µg/kg	0.268	4,654	No	—	ND	No
H+I_Deep	C7680	B26C40	142	144	Aluminum	µg/kg	5,390,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7680	B26C40	142	144	Antimony	µg/kg	127	5,424	No	130	No	No
H+I_Deep	C7680	B26C40	142	144	Arsenic	µg/kg	2,550	2,920	No	20,000	No	No
H+I_Deep	C7680	B26C40	142	144	Barium	µg/kg	57,000	1,648,000	No	132,000	No	No
H+I_Deep	C7680	B26C40	142	144	Beryllium	µg/kg	112	63,216	No	1,510	No	No
H+I_Deep	C7680	B26C40	142	144	Cadmium	µg/kg	68.5	690	No	563	No	No
H+I_Deep	C7680	B26C40	142	144	Chloride	µg/kg	5,730	—	ND	100,000	No	No
H+I_Deep	C7680	B26C40	142	144	Chromium	µg/kg	11,000	480,096,000	No	18,500	No	No
H+I_Deep	C7680	B26C40	142	144	Cobalt	µg/kg	4,940	4,339	Yes	15,700	No	No
H+I_Deep	C7680	B26C40	142	144	Copper	µg/kg	9,370	284,160	No	22,000	No	No
H+I_Deep	C7680	B26C40	142	144	Fluoride	µg/kg	566	2,883,840	No	2,810	No	No
H+I_Deep	C7680	B26C40	142	144	Hexavalent Chromium	µg/kg	11,000	192	Yes	18,500	No	No
H+I_Deep	C7680	B26C40	142	144	Iron	µg/kg	15,700,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7680	B26C40	142	144	Lead	µg/kg	4,590	3,000,060	No	10,200	No	No
H+I_Deep	C7680	B26C40	142	144	Lithium	µg/kg	6,940	192,128	No	13,300	No	No
H+I_Deep	C7680	B26C40	142	144	Manganese	µg/kg	250,000	500,736	No	512,000	No	No
H+I_Deep	C7680	B26C40	142	144	Nickel	µg/kg	8,650	130,400	No	19,100	No	No
H+I_Deep	C7680	B26C40	142	144	Nitrate	µg/kg	15,200	—	ND	52,000	No	No
H+I_Deep	C7680	B26C40	142	144	Nitrite	µg/kg	808	—	ND	—	ND	No
H+I_Deep	C7680	B26C40	142	144	Phosphorus	µg/kg	508,000	—	ND	—	ND	No
H+I_Deep	C7680	B26C40	142	144	Selenium	µg/kg	438	5,200	No	780	No	No
H+I_Deep	C7680	B26C40	142	144	Silver	µg/kg	44.5	13,600	No	167	No	No
H+I_Deep	C7680	B26C40	142	144	Strontium	µg/kg	24,900	6,758,400	No	—	ND	No
H+I_Deep	C7680	B26C40	142	144	Sulfate	µg/kg	159,000	—	ND	237,000	No	No
H+I_Deep	C7680	B26C40	142	144	Thallium	µg/kg	90.6	712	No	185	No	No
H+I_Deep	C7680	B26C40	142	144	Vanadium	µg/kg	35,100	1,600,320	No	85,100	No	No
H+I_Deep	C7680	B26C40	142	144	Zinc	µg/kg	29,800	5,971,200	No	67,800	No	No
H+I_Deep	C7680	B26C41	142	144	Toluene	µg/kg	0.301	4,654	No	—	ND	No
H+I_Deep	C7682	B26C55	18	20	Aluminum	µg/kg	6,240,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7682	B26C55	18	20	Antimony	µg/kg	126	5,424	No	130	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 36 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7682	B26C55	18	20	Arsenic	µg/kg	3,000	2,920	Yes	20,000	No	No
H+I_Deep	C7682	B26C55	18	20	Barium	µg/kg	78,600	1,648,000	No	132,000	No	No
H+I_Deep	C7682	B26C55	18	20	Beryllium	µg/kg	190	63,216	No	1,510	No	No
H+I_Deep	C7682	B26C55	18	20	Cadmium	µg/kg	137	690	No	563	No	No
H+I_Deep	C7682	B26C55	18	20	Chloride	µg/kg	6,410	—	ND	100,000	No	No
H+I_Deep	C7682	B26C55	18	20	Chromium	µg/kg	12,000	480,096,000	No	18,500	No	No
H+I_Deep	C7682	B26C55	18	20	Cobalt	µg/kg	8,580	4,339	Yes	15,700	No	No
H+I_Deep	C7682	B26C55	18	20	Copper	µg/kg	10,800	284,160	No	22,000	No	No
H+I_Deep	C7682	B26C55	18	20	Fluoride	µg/kg	828	2,883,840	No	2,810	No	No
H+I_Deep	C7682	B26C55	18	20	Hexavalent Chromium	µg/kg	12,000	192	Yes	18,500	No	No
H+I_Deep	C7682	B26C55	18	20	Iron	µg/kg	16,800,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7682	B26C55	18	20	Lead	µg/kg	10,300	3,000,060	No	10,200	Yes	No
H+I_Deep	C7682	B26C55	18	20	Lithium	µg/kg	7,180	192,128	No	13,300	No	No
H+I_Deep	C7682	B26C55	18	20	Manganese	µg/kg	354,000	500,736	No	512,000	No	No
H+I_Deep	C7682	B26C55	18	20	Nickel	µg/kg	13,700	130,400	No	19,100	No	No
H+I_Deep	C7682	B26C55	18	20	Nitrate	µg/kg	16,900	—	ND	52,000	No	No
H+I_Deep	C7682	B26C55	18	20	Phosphorus	µg/kg	593,000	—	ND	—	ND	No
H+I_Deep	C7682	B26C55	18	20	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Deep	C7682	B26C55	18	20	Strontium	µg/kg	31,900	6,758,400	No	—	ND	No
H+I_Deep	C7682	B26C55	18	20	Sulfate	µg/kg	94,300	—	ND	237,000	No	No
H+I_Deep	C7682	B26C55	18	20	Thallium	µg/kg	189	712	No	185	Yes	No
H+I_Deep	C7682	B26C55	18	20	Vanadium	µg/kg	34,400	1,600,320	No	85,100	No	No
H+I_Deep	C7682	B26C55	18	20	Zinc	µg/kg	32,200	5,971,200	No	67,800	No	No
H+I_Deep	C7682	B26C56	18	20	Toluene	µg/kg	0.394	4,654	No	—	ND	No
H+I_Deep	C7682	B26C57	45	47	Aluminum	µg/kg	6,960,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7682	B26C57	45	47	Antimony	µg/kg	115	5,424	No	130	No	No
H+I_Deep	C7682	B26C57	45	47	Arsenic	µg/kg	4,000	2,920	Yes	20,000	No	No
H+I_Deep	C7682	B26C57	45	47	Barium	µg/kg	72,800	1,648,000	No	132,000	No	No
H+I_Deep	C7682	B26C57	45	47	Beryllium	µg/kg	193	63,216	No	1,510	No	No
H+I_Deep	C7682	B26C57	45	47	Cadmium	µg/kg	108	690	No	563	No	No
H+I_Deep	C7682	B26C57	45	47	Chloride	µg/kg	2,180	—	ND	100,000	No	No
H+I_Deep	C7682	B26C57	45	47	Chromium	µg/kg	17,600	480,096,000	No	18,500	No	No
H+I_Deep	C7682	B26C57	45	47	Cobalt	µg/kg	7,340	4,339	Yes	15,700	No	No
H+I_Deep	C7682	B26C57	45	47	Copper	µg/kg	11,900	284,160	No	22,000	No	No
H+I_Deep	C7682	B26C57	45	47	Fluoride	µg/kg	1,560	2,883,840	No	2,810	No	No
H+I_Deep	C7682	B26C57	45	47	Hexavalent Chromium	µg/kg	17,600	192	Yes	18,500	No	No
H+I_Deep	C7682	B26C57	45	47	Iron	µg/kg	15,900,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7682	B26C57	45	47	Lead	µg/kg	6,400	3,000,060	No	10,200	No	No
H+I_Deep	C7682	B26C57	45	47	Lithium	µg/kg	8,720	192,128	No	13,300	No	No
H+I_Deep	C7682	B26C57	45	47	Manganese	µg/kg	320,000	500,736	No	512,000	No	No
H+I_Deep	C7682	B26C57	45	47	Nickel	µg/kg	16,400	130,400	No	19,100	No	No
H+I_Deep	C7682	B26C57	45	47	Nitrate	µg/kg	9,340	—	ND	52,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 37 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7682	B26C57	45	47	Nitrite	µg/kg	842	—	ND	—	ND	No
H+I_Deep	C7682	B26C57	45	47	Phosphorus	µg/kg	578,000	—	ND	—	ND	No
H+I_Deep	C7682	B26C57	45	47	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Deep	C7682	B26C57	45	47	Strontium	µg/kg	34,500	6,758,400	No	—	ND	No
H+I_Deep	C7682	B26C57	45	47	Sulfate	µg/kg	109,000	—	ND	237,000	No	No
H+I_Deep	C7682	B26C57	45	47	Thallium	µg/kg	140	712	No	185	No	No
H+I_Deep	C7682	B26C57	45	47	Vanadium	µg/kg	31,000	1,600,320	No	85,100	No	No
H+I_Deep	C7682	B26C57	45	47	Zinc	µg/kg	33,300	5,971,200	No	67,800	No	No
H+I_Deep	C7682	B26C58	45	47	Styrene	µg/kg	0.341	2,244	No	—	ND	No
H+I_Deep	C7682	B26C58	45	47	Toluene	µg/kg	0.5	4,654	No	—	ND	No
H+I_Deep	C7682	B26C59	88	90	Aluminum	µg/kg	6,360,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7682	B26C59	88	90	Antimony	µg/kg	170	5,424	No	130	Yes	No
H+I_Deep	C7682	B26C59	88	90	Arsenic	µg/kg	4,000	2,920	Yes	20,000	No	No
H+I_Deep	C7682	B26C59	88	90	Barium	µg/kg	64,300	1,648,000	No	132,000	No	No
H+I_Deep	C7682	B26C59	88	90	Beryllium	µg/kg	160	63,216	No	1,510	No	No
H+I_Deep	C7682	B26C59	88	90	Chloride	µg/kg	9,750	—	ND	100,000	No	No
H+I_Deep	C7682	B26C59	88	90	Chromium	µg/kg	24,600	480,096,000	No	18,500	Yes	No
H+I_Deep	C7682	B26C59	88	90	Cobalt	µg/kg	5,430	4,339	Yes	15,700	No	No
H+I_Deep	C7682	B26C59	88	90	Copper	µg/kg	10,100	284,160	No	22,000	No	No
H+I_Deep	C7682	B26C59	88	90	Fluoride	µg/kg	739	2,883,840	No	2,810	No	No
H+I_Deep	C7682	B26C59	88	90	Hexavalent Chromium	µg/kg	24,600	192	Yes	18,500	Yes	Yes
H+I_Deep	C7682	B26C59	88	90	Iron	µg/kg	14,100,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7682	B26C59	88	90	Lead	µg/kg	4,000	3,000,060	No	10,200	No	No
H+I_Deep	C7682	B26C59	88	90	Lithium	µg/kg	9,710	192,128	No	13,300	No	No
H+I_Deep	C7682	B26C59	88	90	Manganese	µg/kg	283,000	500,736	No	512,000	No	No
H+I_Deep	C7682	B26C59	88	90	Nickel	µg/kg	18,200	130,400	No	19,100	No	No
H+I_Deep	C7682	B26C59	88	90	Nitrate	µg/kg	19,200	—	ND	52,000	No	No
H+I_Deep	C7682	B26C59	88	90	Nitrite	µg/kg	1,240	—	ND	—	ND	No
H+I_Deep	C7682	B26C59	88	90	Phosphorus	µg/kg	479,000	—	ND	—	ND	No
H+I_Deep	C7682	B26C59	88	90	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Deep	C7682	B26C59	88	90	Strontium	µg/kg	34,000	6,758,400	No	—	ND	No
H+I_Deep	C7682	B26C59	88	90	Sulfate	µg/kg	96,700	—	ND	237,000	No	No
H+I_Deep	C7682	B26C59	88	90	Vanadium	µg/kg	25,800	1,600,320	No	85,100	No	No
H+I_Deep	C7682	B26C59	88	90	Zinc	µg/kg	33,000	5,971,200	No	67,800	No	No
H+I_Deep	C7682	B26C60	88	90	Styrene	µg/kg	0.417	2,244	No	—	ND	No
H+I_Deep	C7682	B26C60	88	90	Toluene	µg/kg	0.438	4,654	No	—	ND	No
H+I_Deep	C7682	B26C61	122	124	Aluminum	µg/kg	5,550,000	480,064,000	No	11,800,000	No	No
H+I_Deep	C7682	B26C61	122	124	Antimony	µg/kg	181	5,424	No	130	Yes	No
H+I_Deep	C7682	B26C61	122	124	Arsenic	µg/kg	3,000	2,920	Yes	20,000	No	No
H+I_Deep	C7682	B26C61	122	124	Barium	µg/kg	61,100	1,648,000	No	132,000	No	No
H+I_Deep	C7682	B26C61	122	124	Beryllium	µg/kg	148	63,216	No	1,510	No	No
H+I_Deep	C7682	B26C61	122	124	Cadmium	µg/kg	116	690	No	563	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 38 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Deep	C7682	B26C61	122	124	Chloride	µg/kg	3,710	—	ND	100,000	No	No
H+I_Deep	C7682	B26C61	122	124	Chromium	µg/kg	12,200	480,096,000	No	18,500	No	No
H+I_Deep	C7682	B26C61	122	124	Cobalt	µg/kg	4,500	4,339	Yes	15,700	No	No
H+I_Deep	C7682	B26C61	122	124	Copper	µg/kg	9,330	284,160	No	22,000	No	No
H+I_Deep	C7682	B26C61	122	124	Fluoride	µg/kg	825	2,883,840	No	2,810	No	No
H+I_Deep	C7682	B26C61	122	124	Hexavalent Chromium	µg/kg	12,200	192	Yes	18,500	No	No
H+I_Deep	C7682	B26C61	122	124	Iron	µg/kg	14,200,000	5,644,800	Yes	32,600,000	No	No
H+I_Deep	C7682	B26C61	122	124	Lead	µg/kg	8,570	3,000,060	No	10,200	No	No
H+I_Deep	C7682	B26C61	122	124	Lithium	µg/kg	8,630	192,128	No	13,300	No	No
H+I_Deep	C7682	B26C61	122	124	Manganese	µg/kg	251,000	500,736	No	512,000	No	No
H+I_Deep	C7682	B26C61	122	124	Nickel	µg/kg	12,100	130,400	No	19,100	No	No
H+I_Deep	C7682	B26C61	122	124	Nitrate	µg/kg	5,850	—	ND	52,000	No	No
H+I_Deep	C7682	B26C61	122	124	Nitrite	µg/kg	276	—	ND	—	ND	No
H+I_Deep	C7682	B26C61	122	124	Phosphorus	µg/kg	534,000	—	ND	—	ND	No
H+I_Deep	C7682	B26C61	122	124	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Deep	C7682	B26C61	122	124	Strontium	µg/kg	29,300	6,758,400	No	—	ND	No
H+I_Deep	C7682	B26C61	122	124	Sulfate	µg/kg	61,600	—	ND	237,000	No	No
H+I_Deep	C7682	B26C61	122	124	Thallium	µg/kg	134	712	No	185	No	No
H+I_Deep	C7682	B26C61	122	124	Vanadium	µg/kg	25,600	1,600,320	No	85,100	No	No
H+I_Deep	C7682	B26C61	122	124	Zinc	µg/kg	30,900	5,971,200	No	67,800	No	No
H+I_Shallow	C7680	B26C26	5	7	Aluminum	µg/kg	7,730,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Antimony	µg/kg	202	5,424	No	130	Yes	No
H+I_Shallow	C7680	B26C26	5	7	Arsenic	µg/kg	3,670	2,920	Yes	20,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Barium	µg/kg	80,600	1,648,000	No	132,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Beryllium	µg/kg	199	63,216	No	1,510	No	No
H+I_Shallow	C7680	B26C26	5	7	Cadmium	µg/kg	87.7	690	No	563	No	No
H+I_Shallow	C7680	B26C26	5	7	Chloride	µg/kg	706	—	ND	100,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Chromium	µg/kg	10,100	480,096,000	No	18,500	No	No
H+I_Shallow	C7680	B26C26	5	7	Cobalt	µg/kg	7,990	4,339	Yes	15,700	No	No
H+I_Shallow	C7680	B26C26	5	7	Copper	µg/kg	9,970	284,160	No	22,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Fluoride	µg/kg	1,070	2,883,840	No	2,810	No	No
H+I_Shallow	C7680	B26C26	5	7	Hexavalent Chromium	µg/kg	10,100	192	Yes	18,500	No	No
H+I_Shallow	C7680	B26C26	5	7	Iron	µg/kg	22,200,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Lead	µg/kg	5,150	3,000,060	No	10,200	No	No
H+I_Shallow	C7680	B26C26	5	7	Lithium	µg/kg	7,230	192,128	No	13,300	No	No
H+I_Shallow	C7680	B26C26	5	7	Manganese	µg/kg	346,000	500,736	No	512,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Nickel	µg/kg	8,650	130,400	No	19,100	No	No
H+I_Shallow	C7680	B26C26	5	7	Nitrate	µg/kg	11,200	—	ND	52,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Nitrite	µg/kg	736	—	ND	—	ND	No
H+I_Shallow	C7680	B26C26	5	7	Phosphorus	µg/kg	794,000	—	ND	—	ND	No
H+I_Shallow	C7680	B26C26	5	7	Selenium	µg/kg	523	5,200	No	780	No	No
H+I_Shallow	C7680	B26C26	5	7	Silver	µg/kg	62.4	13,600	No	167	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 39 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Shallow	C7680	B26C26	5	7	Strontium	µg/kg	23,700	6,758,400	No	—	ND	No
H+I_Shallow	C7680	B26C26	5	7	Sulfate	µg/kg	6,370	—	ND	237,000	No	No
H+I_Shallow	C7680	B26C26	5	7	Thallium	µg/kg	83.4	712	No	185	No	No
H+I_Shallow	C7680	B26C26	5	7	Vanadium	µg/kg	52,300	1,600,320	No	85,100	No	No
H+I_Shallow	C7680	B26C26	5	7	Zinc	µg/kg	42,400	5,971,200	No	67,800	No	No
H+I_Shallow	C7680	B26C27	5	7	Styrene	µg/kg	0.333	2,244	No	—	ND	No
H+I_Shallow	C7680	B26C27	5	7	Toluene	µg/kg	0.387	4,654	No	—	ND	No
H+I_Shallow	C7680	B26C28	10	12	Aluminum	µg/kg	4,590,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Antimony	µg/kg	77.9	5,424	No	130	No	No
H+I_Shallow	C7680	B26C28	10	12	Arsenic	µg/kg	3,030	2,920	Yes	20,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Barium	µg/kg	75,900	1,648,000	No	132,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Cadmium	µg/kg	70.2	690	No	563	No	No
H+I_Shallow	C7680	B26C28	10	12	Chloride	µg/kg	632	—	ND	100,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Chromium	µg/kg	5,340	480,096,000	No	18,500	No	No
H+I_Shallow	C7680	B26C28	10	12	Cobalt	µg/kg	11,300	4,339	Yes	15,700	No	No
H+I_Shallow	C7680	B26C28	10	12	Copper	µg/kg	13,500	284,160	No	22,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Fluoride	µg/kg	372	2,883,840	No	2,810	No	No
H+I_Shallow	C7680	B26C28	10	12	Hexavalent Chromium	µg/kg	5,340	192	Yes	18,500	No	No
H+I_Shallow	C7680	B26C28	10	12	Iron	µg/kg	31,200,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Lead	µg/kg	2,460	3,000,060	No	10,200	No	No
H+I_Shallow	C7680	B26C28	10	12	Lithium	µg/kg	3,560	192,128	No	13,300	No	No
H+I_Shallow	C7680	B26C28	10	12	Manganese	µg/kg	387,000	500,736	No	512,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Nickel	µg/kg	6,610	130,400	No	19,100	No	No
H+I_Shallow	C7680	B26C28	10	12	Nitrate	µg/kg	2,750	—	ND	52,000	No	No
H+I_Shallow	C7680	B26C28	10	12	Nitrite	µg/kg	613	—	ND	—	ND	No
H+I_Shallow	C7680	B26C28	10	12	Phosphorus	µg/kg	1,350,000	—	ND	—	ND	No
H+I_Shallow	C7680	B26C28	10	12	Selenium	µg/kg	965	5,200	No	780	Yes	No
H+I_Shallow	C7680	B26C28	10	12	Silver	µg/kg	59.1	13,600	No	167	No	No
H+I_Shallow	C7680	B26C28	10	12	Strontium	µg/kg	20,200	6,758,400	No	—	ND	No
H+I_Shallow	C7680	B26C28	10	12	Sulfate	µg/kg	458,000	—	ND	237,000	Yes	No
H+I_Shallow	C7680	B26C28	10	12	Thallium	µg/kg	54.6	712	No	185	No	No
H+I_Shallow	C7680	B26C28	10	12	Vanadium	µg/kg	82,600	1,600,320	No	85,100	No	No
H+I_Shallow	C7680	B26C28	10	12	Zinc	µg/kg	53,000	5,971,200	No	67,800	No	No
H+I_Shallow	C7680	B26C30	14	16	Aluminum	µg/kg	6,930,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Antimony	µg/kg	111	5,424	No	130	No	No
H+I_Shallow	C7680	B26C30	14	16	Arsenic	µg/kg	2,950	2,920	Yes	20,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Barium	µg/kg	89,700	1,648,000	No	132,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Beryllium	µg/kg	136	63,216	No	1,510	No	No
H+I_Shallow	C7680	B26C30	14	16	Cadmium	µg/kg	66.1	690	No	563	No	No
H+I_Shallow	C7680	B26C30	14	16	Chloride	µg/kg	2,090	—	ND	100,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Chromium	µg/kg	26,800	480,096,000	No	18,500	Yes	No
H+I_Shallow	C7680	B26C30	14	16	Cobalt	µg/kg	10,300	4,339	Yes	15,700	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 40 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Shallow	C7680	B26C30	14	16	Copper	µg/kg	11,200	284,160	No	22,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Fluoride	µg/kg	1,500	2,883,840	No	2,810	No	No
H+I_Shallow	C7680	B26C30	14	16	Hexavalent Chromium	µg/kg	26,800	192	Yes	18,500	Yes	Yes
H+I_Shallow	C7680	B26C30	14	16	Iron	µg/kg	26,800,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Lead	µg/kg	3,370	3,000,060	No	10,200	No	No
H+I_Shallow	C7680	B26C30	14	16	Lithium	µg/kg	6,800	192,128	No	13,300	No	No
H+I_Shallow	C7680	B26C30	14	16	Manganese	µg/kg	424,000	500,736	No	512,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Nickel	µg/kg	18,300	130,400	No	19,100	No	No
H+I_Shallow	C7680	B26C30	14	16	Nitrate	µg/kg	7,740	—	ND	52,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Nitrite	µg/kg	1,120	—	ND	—	ND	No
H+I_Shallow	C7680	B26C30	14	16	Phosphorus	µg/kg	748,000	—	ND	—	ND	No
H+I_Shallow	C7680	B26C30	14	16	Selenium	µg/kg	602	5,200	No	780	No	No
H+I_Shallow	C7680	B26C30	14	16	Silver	µg/kg	61.8	13,600	No	167	No	No
H+I_Shallow	C7680	B26C30	14	16	Strontium	µg/kg	35,100	6,758,400	No	—	ND	No
H+I_Shallow	C7680	B26C30	14	16	Sulfate	µg/kg	43,900	—	ND	237,000	No	No
H+I_Shallow	C7680	B26C30	14	16	Thallium	µg/kg	77.4	712	No	185	No	No
H+I_Shallow	C7680	B26C30	14	16	Vanadium	µg/kg	75,100	1,600,320	No	85,100	No	No
H+I_Shallow	C7680	B26C30	14	16	Zinc	µg/kg	42,800	5,971,200	No	67,800	No	No
H+I_Shallow	C7680	B26C31	14	16	Styrene	µg/kg	0.273	2,244	No	—	ND	No
H+I_Shallow	C7680	B26C31	14	16	Toluene	µg/kg	0.601	4,654	No	—	ND	No
H+I_Shallow	C7680	B26JK8	0	1	Aluminum	µg/kg	7,310,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Antimony	µg/kg	214	5,424	No	130	Yes	No
H+I_Shallow	C7680	B26JK8	0	1	Arsenic	µg/kg	4,920	2,920	Yes	20,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Barium	µg/kg	77,700	1,648,000	No	132,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Beryllium	µg/kg	190	63,216	No	1,510	No	No
H+I_Shallow	C7680	B26JK8	0	1	Cadmium	µg/kg	84.8	690	No	563	No	No
H+I_Shallow	C7680	B26JK8	0	1	Chromium	µg/kg	9,090	480,096,000	No	18,500	No	No
H+I_Shallow	C7680	B26JK8	0	1	Cobalt	µg/kg	8,140	4,339	Yes	15,700	No	No
H+I_Shallow	C7680	B26JK8	0	1	Copper	µg/kg	11,300	284,160	No	22,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Fluoride	µg/kg	846	2,883,840	No	2,810	No	No
H+I_Shallow	C7680	B26JK8	0	1	Hexavalent Chromium	µg/kg	9,090	192	Yes	18,500	No	No
H+I_Shallow	C7680	B26JK8	0	1	Iron	µg/kg	22,300,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Lead	µg/kg	5,330	3,000,060	No	10,200	No	No
H+I_Shallow	C7680	B26JK8	0	1	Lithium	µg/kg	7,810	192,128	No	13,300	No	No
H+I_Shallow	C7680	B26JK8	0	1	Manganese	µg/kg	332,000	500,736	No	512,000	No	No
H+I_Shallow	C7680	B26JK8	0	1	Nickel	µg/kg	11,100	130,400	No	19,100	No	No
H+I_Shallow	C7680	B26JK8	0	1	Nitrite	µg/kg	232	—	ND	—	ND	No
H+I_Shallow	C7680	B26JK8	0	1	Phosphorus	µg/kg	801,000	—	ND	—	ND	No
H+I_Shallow	C7680	B26JK8	0	1	Selenium	µg/kg	615	5,200	No	780	No	No
H+I_Shallow	C7680	B26JK8	0	1	Silver	µg/kg	66.7	13,600	No	167	No	No
H+I_Shallow	C7680	B26JK8	0	1	Strontium	µg/kg	32,600	6,758,400	No	—	ND	No
H+I_Shallow	C7680	B26JK8	0	1	Thallium	µg/kg	79.6	712	No	185	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 41 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Shallow	C7680	B26JK8	0	1	Vanadium	µg/kg	53,400	1,600,320	No	85,100	No	No
H+I_Shallow	C7680	B26JK8	0	1	Zinc	µg/kg	43,000	5,971,200	No	67,800	No	No
H+I_Shallow	C7680	B26JK9	0	1	Chloride	µg/kg	5,570	—	ND	100,000	No	No
H+I_Shallow	C7680	B26JK9	0	1	Di-n-butylphthalate	µg/kg	570	56,444	No	—	ND	No
H+I_Shallow	C7680	B26JK9	0	1	Nitrate	µg/kg	11,500	—	ND	52,000	No	No
H+I_Shallow	C7680	B26JK9	0	1	Sulfate	µg/kg	2,660	—	ND	237,000	No	No
H+I_Shallow	C7680	B26JL8	0	1	Styrene	µg/kg	0.308	2,244	No	—	ND	No
H+I_Shallow	C7680	B26JL8	0	1	Toluene	µg/kg	0.267	4,654	No	—	ND	No
H+I_Shallow	C7682	B26C47	5	7	Aluminum	µg/kg	5,640,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Antimony	µg/kg	420	5,424	No	130	Yes	No
H+I_Shallow	C7682	B26C47	5	7	Arsenic	µg/kg	5,000	2,920	Yes	20,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Barium	µg/kg	71,000	1,648,000	No	132,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Beryllium	µg/kg	204	63,216	No	1,510	No	No
H+I_Shallow	C7682	B26C47	5	7	Cadmium	µg/kg	196	690	No	563	No	No
H+I_Shallow	C7682	B26C47	5	7	Chloride	µg/kg	18,200	—	ND	100,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Chromium	µg/kg	7,710	480,096,000	No	18,500	No	No
H+I_Shallow	C7682	B26C47	5	7	Cobalt	µg/kg	6,680	4,339	Yes	15,700	No	No
H+I_Shallow	C7682	B26C47	5	7	Copper	µg/kg	11,900	284,160	No	22,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Fluoride	µg/kg	1,600	2,883,840	No	2,810	No	No
H+I_Shallow	C7682	B26C47	5	7	Hexavalent Chromium	µg/kg	7,710	192	Yes	18,500	No	No
H+I_Shallow	C7682	B26C47	5	7	Iron	µg/kg	14,300,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Lead	µg/kg	11,300	3,000,060	No	10,200	Yes	No
H+I_Shallow	C7682	B26C47	5	7	Lithium	µg/kg	6,570	192,128	No	13,300	No	No
H+I_Shallow	C7682	B26C47	5	7	Manganese	µg/kg	270,000	500,736	No	512,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Nickel	µg/kg	8,930	130,400	No	19,100	No	No
H+I_Shallow	C7682	B26C47	5	7	Nitrate	µg/kg	23,800	—	ND	52,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Phosphorus	µg/kg	706,000	—	ND	—	ND	No
H+I_Shallow	C7682	B26C47	5	7	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Shallow	C7682	B26C47	5	7	Strontium	µg/kg	21,500	6,758,400	No	—	ND	No
H+I_Shallow	C7682	B26C47	5	7	Sulfate	µg/kg	19,600	—	ND	237,000	No	No
H+I_Shallow	C7682	B26C47	5	7	Thallium	µg/kg	180	712	No	185	No	No
H+I_Shallow	C7682	B26C47	5	7	Vanadium	µg/kg	24,500	1,600,320	No	85,100	No	No
H+I_Shallow	C7682	B26C47	5	7	Zinc	µg/kg	29,500	5,971,200	No	67,800	No	No
H+I_Shallow	C7682	B26C48	5	7	Styrene	µg/kg	0.326	2,244	No	—	ND	No
H+I_Shallow	C7682	B26C48	5	7	Toluene	µg/kg	0.308	4,654	No	—	ND	No
H+I_Shallow	C7682	B26C50	10	12	Styrene	µg/kg	0.359	2,244	No	—	ND	No
H+I_Shallow	C7682	B26C50	10	12	Toluene	µg/kg	0.347	4,654	No	—	ND	No
H+I_Shallow	C7682	B26C51	12	14	Aluminum	µg/kg	6,030,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Antimony	µg/kg	110	5,424	No	130	No	No
H+I_Shallow	C7682	B26C51	12	14	Arsenic	µg/kg	3,000	2,920	Yes	20,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Barium	µg/kg	89,600	1,648,000	No	132,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Beryllium	µg/kg	159	63,216	No	1,510	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 42 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Shallow	C7682	B26C51	12	14	Cadmium	µg/kg	136	690	No	563	No	No
H+I_Shallow	C7682	B26C51	12	14	Chloride	µg/kg	2,390	—	ND	100,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Chromium	µg/kg	10,100	480,096,000	No	18,500	No	No
H+I_Shallow	C7682	B26C51	12	14	Cobalt	µg/kg	9,840	4,339	Yes	15,700	No	No
H+I_Shallow	C7682	B26C51	12	14	Copper	µg/kg	11,300	284,160	No	22,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Fluoride	µg/kg	1,450	2,883,840	No	2,810	No	No
H+I_Shallow	C7682	B26C51	12	14	Hexavalent Chromium	µg/kg	10,100	192	Yes	18,500	No	No
H+I_Shallow	C7682	B26C51	12	14	Iron	µg/kg	22,800,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Lead	µg/kg	6,860	3,000,060	No	10,200	No	No
H+I_Shallow	C7682	B26C51	12	14	Lithium	µg/kg	5,990	192,128	No	13,300	No	No
H+I_Shallow	C7682	B26C51	12	14	Manganese	µg/kg	383,000	500,736	No	512,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Molybdenum	µg/kg	1,980	32,320	No	470	Yes	No
H+I_Shallow	C7682	B26C51	12	14	Nickel	µg/kg	10,400	130,400	No	19,100	No	No
H+I_Shallow	C7682	B26C51	12	14	Nitrate	µg/kg	12,200	—	ND	52,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Nitrite	µg/kg	1,850	—	ND	—	ND	No
H+I_Shallow	C7682	B26C51	12	14	Phosphorus	µg/kg	762,000	—	ND	—	ND	No
H+I_Shallow	C7682	B26C51	12	14	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Shallow	C7682	B26C51	12	14	Strontium	µg/kg	31,100	6,758,400	No	—	ND	No
H+I_Shallow	C7682	B26C51	12	14	Sulfate	µg/kg	95,600	—	ND	237,000	No	No
H+I_Shallow	C7682	B26C51	12	14	Thallium	µg/kg	194	712	No	185	Yes	No
H+I_Shallow	C7682	B26C51	12	14	Vanadium	µg/kg	52,300	1,600,320	No	85,100	No	No
H+I_Shallow	C7682	B26C51	12	14	Zinc	µg/kg	36,100	5,971,200	No	67,800	No	No
H+I_Shallow	C7682	B26C53	14	16	Aluminum	µg/kg	6,380,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Antimony	µg/kg	89.7	5,424	No	130	No	No
H+I_Shallow	C7682	B26C53	14	16	Arsenic	µg/kg	2,000	2,920	No	20,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Barium	µg/kg	103,000	1,648,000	No	132,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Beryllium	µg/kg	190	63,216	No	1,510	No	No
H+I_Shallow	C7682	B26C53	14	16	Butylbenzylphthalate	µg/kg	200	12,845	No	—	ND	No
H+I_Shallow	C7682	B26C53	14	16	Cadmium	µg/kg	127	690	No	563	No	No
H+I_Shallow	C7682	B26C53	14	16	Chloride	µg/kg	1,980	—	ND	100,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Chromium	µg/kg	14,900	480,096,000	No	18,500	No	No
H+I_Shallow	C7682	B26C53	14	16	Cobalt	µg/kg	10,600	4,339	Yes	15,700	No	No
H+I_Shallow	C7682	B26C53	14	16	Copper	µg/kg	11,300	284,160	No	22,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Fluoride	µg/kg	1,490	2,883,840	No	2,810	No	No
H+I_Shallow	C7682	B26C53	14	16	Hexavalent Chromium	µg/kg	14,900	192	Yes	18,500	No	No
H+I_Shallow	C7682	B26C53	14	16	Iron	µg/kg	24,000,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Lead	µg/kg	6,640	3,000,060	No	10,200	No	No
H+I_Shallow	C7682	B26C53	14	16	Lithium	µg/kg	7,040	192,128	No	13,300	No	No
H+I_Shallow	C7682	B26C53	14	16	Manganese	µg/kg	465,000	500,736	No	512,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Molybdenum	µg/kg	2,000	32,320	No	470	Yes	No
H+I_Shallow	C7682	B26C53	14	16	Nickel	µg/kg	12,300	130,400	No	19,100	No	No
H+I_Shallow	C7682	B26C53	14	16	Nitrate	µg/kg	12,800	—	ND	52,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 43 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
H+I_Shallow	C7682	B26C53	14	16	Nitrite	µg/kg	1,340	—	ND	—	ND	No
H+I_Shallow	C7682	B26C53	14	16	Phosphorus	µg/kg	702,000	—	ND	—	ND	No
H+I_Shallow	C7682	B26C53	14	16	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Shallow	C7682	B26C53	14	16	Strontium	µg/kg	37,700	6,758,400	No	—	ND	No
H+I_Shallow	C7682	B26C53	14	16	Sulfate	µg/kg	50,900	—	ND	237,000	No	No
H+I_Shallow	C7682	B26C53	14	16	Thallium	µg/kg	177	712	No	185	No	No
H+I_Shallow	C7682	B26C53	14	16	Vanadium	µg/kg	53,800	1,600,320	No	85,100	No	No
H+I_Shallow	C7682	B26C53	14	16	Zinc	µg/kg	38,100	5,971,200	No	67,800	No	No
H+I_Shallow	C7682	B26C54	14	16	Styrene	µg/kg	0.464	2,244	No	—	ND	No
H+I_Shallow	C7682	B26C54	14	16	Toluene	µg/kg	1.05	4,654	No	—	ND	No
H+I_Shallow	C7682	B26JL0	0	1	Cadmium	µg/kg	100	690	No	563	No	No
H+I_Shallow	C7682	B26JL0	0	1	Chloride	µg/kg	36,300	—	ND	100,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Aluminum	µg/kg	6,100,000	480,064,000	No	11,800,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Antimony	µg/kg	218	5,424	No	130	Yes	No
H+I_Shallow	C7682	B26JL1	0	1	Arsenic	µg/kg	7,000	2,920	Yes	20,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Barium	µg/kg	82,200	1,648,000	No	132,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Beryllium	µg/kg	212	63,216	No	1,510	No	No
H+I_Shallow	C7682	B26JL1	0	1	Chromium	µg/kg	7,550	480,096,000	No	18,500	No	No
H+I_Shallow	C7682	B26JL1	0	1	Cobalt	µg/kg	7,850	4,339	Yes	15,700	No	No
H+I_Shallow	C7682	B26JL1	0	1	Copper	µg/kg	11,800	284,160	No	22,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Fluoride	µg/kg	2,100	2,883,840	No	2,810	No	No
H+I_Shallow	C7682	B26JL1	0	1	Hexavalent Chromium	µg/kg	7,550	192	Yes	18,500	No	No
H+I_Shallow	C7682	B26JL1	0	1	Iron	µg/kg	16,300,000	5,644,800	Yes	32,600,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Lead	µg/kg	7,000	3,000,060	No	10,200	No	No
H+I_Shallow	C7682	B26JL1	0	1	Lithium	µg/kg	8,010	192,128	No	13,300	No	No
H+I_Shallow	C7682	B26JL1	0	1	Manganese	µg/kg	332,000	500,736	No	512,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Nickel	µg/kg	9,610	130,400	No	19,100	No	No
H+I_Shallow	C7682	B26JL1	0	1	Nitrate	µg/kg	54,600	—	ND	52,000	Yes	No
H+I_Shallow	C7682	B26JL1	0	1	Nitrite	µg/kg	1,210	—	ND	—	ND	No
H+I_Shallow	C7682	B26JL1	0	1	Phosphorus	µg/kg	781,000	—	ND	—	ND	No
H+I_Shallow	C7682	B26JL1	0	1	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
H+I_Shallow	C7682	B26JL1	0	1	Strontium	µg/kg	30,500	6,758,400	No	—	ND	No
H+I_Shallow	C7682	B26JL1	0	1	Sulfate	µg/kg	11,800	—	ND	237,000	No	No
H+I_Shallow	C7682	B26JL1	0	1	Total petroleum hydrocarbons - diesel range	µg/kg	12,000	2,000,000	No	—	ND	No
H+I_Shallow	C7682	B26JL1	0	1	Vanadium	µg/kg	27,000	1,600,320	No	85,100	No	No
H+I_Shallow	C7682	B26JL1	0	1	Zinc	µg/kg	36,400	5,971,200	No	67,800	No	No
H+I_Shallow	C7682	B26JM0	0	1	Styrene	µg/kg	0.43	2,244	No	—	ND	No
H+I_Shallow	C7682	B26JM0	0	1	Toluene	µg/kg	0.386	4,654	No	—	ND	No
J_Deep	C8100	B2C1M5	54	58	Aluminum	µg/kg	6,920,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1M5	54	58	Antimony	µg/kg	160	5,424	No	130	Yes	No
J_Deep	C8100	B2C1M5	54	58	Arsenic	µg/kg	3,670	2,920	Yes	20,000	No	No
J_Deep	C8100	B2C1M5	54	58	Barium	µg/kg	67,900	1,648,000	No	132,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 44 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Deep	C8100	B2C1M5	54	58	Beryllium	µg/kg	152	63,216	No	1,510	No	No
J_Deep	C8100	B2C1M5	54	58	Cadmium	µg/kg	95.9	690	No	563	No	No
J_Deep	C8100	B2C1M5	54	58	Chloride	µg/kg	864	—	ND	100,000	No	No
J_Deep	C8100	B2C1M5	54	58	Chromium	µg/kg	8,840	480,096,000	No	18,500	No	No
J_Deep	C8100	B2C1M5	54	58	Cobalt	µg/kg	5,790	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1M5	54	58	Copper	µg/kg	9,780	284,160	No	22,000	No	No
J_Deep	C8100	B2C1M5	54	58	Fluoride	µg/kg	1,550	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1M5	54	58	Hexavalent Chromium	µg/kg	8,840	192	Yes	18,500	No	No
J_Deep	C8100	B2C1M5	54	58	Iron	µg/kg	19,200,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1M5	54	58	Lead	µg/kg	4,800	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1M5	54	58	Lithium	µg/kg	6,990	192,128	No	13,300	No	No
J_Deep	C8100	B2C1M5	54	58	Manganese	µg/kg	297,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1M5	54	58	Nickel	µg/kg	9,380	130,400	No	19,100	No	No
J_Deep	C8100	B2C1M5	54	58	Nitrate	µg/kg	16,800	—	ND	52,000	No	No
J_Deep	C8100	B2C1M5	54	58	Nitrite	µg/kg	813	—	ND	—	ND	No
J_Deep	C8100	B2C1M5	54	58	Phosphorus	µg/kg	758,000	—	ND	—	ND	No
J_Deep	C8100	B2C1M5	54	58	Silver	µg/kg	48.4	13,600	No	167	No	No
J_Deep	C8100	B2C1M5	54	58	Strontium	µg/kg	26,500	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1M5	54	58	Sulfate	µg/kg	23,900	—	ND	237,000	No	No
J_Deep	C8100	B2C1M5	54	58	Thallium	µg/kg	74.8	712	No	185	No	No
J_Deep	C8100	B2C1M5	54	58	Vanadium	µg/kg	43,300	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1M5	54	58	Zinc	µg/kg	38,300	5,971,200	No	67,800	No	No
J_Deep	C8100	B2C1M7	76	78	Aluminum	µg/kg	6,590,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1M7	76	78	Antimony	µg/kg	152	5,424	No	130	Yes	No
J_Deep	C8100	B2C1M7	76	78	Arsenic	µg/kg	3,560	2,920	Yes	20,000	No	No
J_Deep	C8100	B2C1M7	76	78	Barium	µg/kg	70,000	1,648,000	No	132,000	No	No
J_Deep	C8100	B2C1M7	76	78	Beryllium	µg/kg	155	63,216	No	1,510	No	No
J_Deep	C8100	B2C1M7	76	78	Cadmium	µg/kg	59.2	690	No	563	No	No
J_Deep	C8100	B2C1M7	76	78	Chloride	µg/kg	905	—	ND	100,000	No	No
J_Deep	C8100	B2C1M7	76	78	Chromium	µg/kg	14,600	480,096,000	No	18,500	No	No
J_Deep	C8100	B2C1M7	76	78	Cobalt	µg/kg	5,990	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1M7	76	78	Copper	µg/kg	9,310	284,160	No	22,000	No	No
J_Deep	C8100	B2C1M7	76	78	Fluoride	µg/kg	798	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1M7	76	78	Hexavalent Chromium	µg/kg	14,600	192	Yes	18,500	No	No
J_Deep	C8100	B2C1M7	76	78	Iron	µg/kg	15,900,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1M7	76	78	Lead	µg/kg	3,740	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1M7	76	78	Lithium	µg/kg	9,490	192,128	No	13,300	No	No
J_Deep	C8100	B2C1M7	76	78	Manganese	µg/kg	321,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1M7	76	78	Nickel	µg/kg	13,700	130,400	No	19,100	No	No
J_Deep	C8100	B2C1M7	76	78	Nitrate	µg/kg	4,770	—	ND	52,000	No	No
J_Deep	C8100	B2C1M7	76	78	Nitrite	µg/kg	1,880	—	ND	—	ND	No
J_Deep	C8100	B2C1M7	76	78	Phosphorus	µg/kg	522,000	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 45 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Deep	C8100	B2C1M7	76	78	Silver	µg/kg	46.7	13,600	No	167	No	No
J_Deep	C8100	B2C1M7	76	78	Strontium	µg/kg	31,400	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1M7	76	78	Sulfate	µg/kg	19,700	—	ND	237,000	No	No
J_Deep	C8100	B2C1M7	76	78	Thallium	µg/kg	74.7	712	No	185	No	No
J_Deep	C8100	B2C1M7	76	78	Toluene	µg/kg	220	4,654	No	—	ND	No
J_Deep	C8100	B2C1M7	76	78	Vanadium	µg/kg	31,400	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1M7	76	78	Zinc	µg/kg	33,700	5,971,200	No	67,800	No	No
J_Deep	C8100	B2C1M8	118	120	Aluminum	µg/kg	6,050,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1M8	118	120	Antimony	µg/kg	162	5,424	No	130	Yes	No
J_Deep	C8100	B2C1M8	118	120	Arsenic	µg/kg	3,420	2,920	Yes	20,000	No	No
J_Deep	C8100	B2C1M8	118	120	Barium	µg/kg	60,800	1,648,000	No	132,000	No	No
J_Deep	C8100	B2C1M8	118	120	Beryllium	µg/kg	143	63,216	No	1,510	No	No
J_Deep	C8100	B2C1M8	118	120	Cadmium	µg/kg	62.9	690	No	563	No	No
J_Deep	C8100	B2C1M8	118	120	Chloride	µg/kg	1,120	—	ND	100,000	No	No
J_Deep	C8100	B2C1M8	118	120	Chromium	µg/kg	11,500	480,096,000	No	18,500	No	No
J_Deep	C8100	B2C1M8	118	120	Cobalt	µg/kg	5,540	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1M8	118	120	Copper	µg/kg	8,780	284,160	No	22,000	No	No
J_Deep	C8100	B2C1M8	118	120	Di-n-octylphthalate	µg/kg	86.3	266,240,641	No	—	ND	No
J_Deep	C8100	B2C1M8	118	120	Fluoride	µg/kg	521	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1M8	118	120	Hexavalent Chromium	µg/kg	11,500	192	Yes	18,500	No	No
J_Deep	C8100	B2C1M8	118	120	Iron	µg/kg	15,200,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1M8	118	120	Lead	µg/kg	3,950	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1M8	118	120	Lithium	µg/kg	7,900	192,128	No	13,300	No	No
J_Deep	C8100	B2C1M8	118	120	Manganese	µg/kg	254,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1M8	118	120	Nickel	µg/kg	9,180	130,400	No	19,100	No	No
J_Deep	C8100	B2C1M8	118	120	Nitrate	µg/kg	4,560	—	ND	52,000	No	No
J_Deep	C8100	B2C1M8	118	120	Nitrite	µg/kg	394	—	ND	—	ND	No
J_Deep	C8100	B2C1M8	118	120	Phosphorus	µg/kg	531,000	—	ND	—	ND	No
J_Deep	C8100	B2C1M8	118	120	Silver	µg/kg	48.9	13,600	No	167	No	No
J_Deep	C8100	B2C1M8	118	120	Strontium	µg/kg	27,500	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1M8	118	120	Sulfate	µg/kg	38,300	—	ND	237,000	No	No
J_Deep	C8100	B2C1M8	118	120	Thallium	µg/kg	66.2	712	No	185	No	No
J_Deep	C8100	B2C1M8	118	120	Tin	µg/kg	3,850	48,038,400	No	—	ND	No
J_Deep	C8100	B2C1M8	118	120	Vanadium	µg/kg	31,700	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1M8	118	120	Zinc	µg/kg	32,100	5,971,200	No	67,800	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Aluminum	µg/kg	6,650,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Antimony	µg/kg	241	5,424	No	130	Yes	No
J_Deep	C8100	B2C1M9	168.6	170.6	Arsenic	µg/kg	3,850	2,920	Yes	20,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Barium	µg/kg	63,500	1,648,000	No	132,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Beryllium	µg/kg	164	63,216	No	1,510	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Butylbenzylphthalate	µg/kg	80.8	12,845	No	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Cadmium	µg/kg	66.6	690	No	563	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 46 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Deep	C8100	B2C1M9	168.6	170.6	Chloride	µg/kg	2,480	—	ND	100,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Chromium	µg/kg	14,300	480,096,000	No	18,500	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Cobalt	µg/kg	4,500	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Copper	µg/kg	9,220	284,160	No	22,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Di-n-octylphthalate	µg/kg	79	266,240,641	No	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Fluoride	µg/kg	1,880	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Hexavalent Chromium	µg/kg	14,300	192	Yes	18,500	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Iron	µg/kg	14,600,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Lead	µg/kg	4,190	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Lithium	µg/kg	10,300	192,128	No	13,300	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Manganese	µg/kg	273,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Nickel	µg/kg	11,300	130,400	No	19,100	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Nitrate	µg/kg	8,540	—	ND	52,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Nitrite	µg/kg	2,650	—	ND	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Phosphorus	µg/kg	457,000	—	ND	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Silver	µg/kg	45.1	13,600	No	167	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Strontium	µg/kg	32,700	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Sulfate	µg/kg	117,000	—	ND	237,000	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Thallium	µg/kg	80.7	712	No	185	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Tin	µg/kg	2,020	48,038,400	No	—	ND	No
J_Deep	C8100	B2C1M9	168.6	170.6	Vanadium	µg/kg	30,200	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1M9	168.6	170.6	Zinc	µg/kg	31,800	5,971,200	No	67,800	No	No
J_Deep	C8100	B2C1N0	202	204	Aluminum	µg/kg	5,740,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1N0	202	204	Antimony	µg/kg	130	5,424	No	130	No	No
J_Deep	C8100	B2C1N0	202	204	Arsenic	µg/kg	2,670	2,920	No	20,000	No	No
J_Deep	C8100	B2C1N0	202	204	Barium	µg/kg	55,400	1,648,000	No	132,000	No	No
J_Deep	C8100	B2C1N0	202	204	Beryllium	µg/kg	114	63,216	No	1,510	No	No
J_Deep	C8100	B2C1N0	202	204	Butylbenzylphthalate	µg/kg	85.5	12,845	No	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Cadmium	µg/kg	70.4	690	No	563	No	No
J_Deep	C8100	B2C1N0	202	204	Chloride	µg/kg	7,080	—	ND	100,000	No	No
J_Deep	C8100	B2C1N0	202	204	Chromium	µg/kg	14,200	480,096,000	No	18,500	No	No
J_Deep	C8100	B2C1N0	202	204	Cobalt	µg/kg	5,510	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1N0	202	204	Copper	µg/kg	11,100	284,160	No	22,000	No	No
J_Deep	C8100	B2C1N0	202	204	Di-n-octylphthalate	µg/kg	80	266,240,641	No	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Fluoride	µg/kg	1,130	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1N0	202	204	Hexavalent Chromium	µg/kg	14,200	192	Yes	18,500	No	No
J_Deep	C8100	B2C1N0	202	204	Iron	µg/kg	15,900,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1N0	202	204	Lead	µg/kg	2,910	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1N0	202	204	Lithium	µg/kg	7,330	192,128	No	13,300	No	No
J_Deep	C8100	B2C1N0	202	204	Manganese	µg/kg	231,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1N0	202	204	Nickel	µg/kg	11,400	130,400	No	19,100	No	No
J_Deep	C8100	B2C1N0	202	204	Nitrate	µg/kg	18,800	—	ND	52,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 47 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Deep	C8100	B2C1N0	202	204	Nitrite	µg/kg	1,610	—	ND	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Phosphorus	µg/kg	609,000	—	ND	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Silver	µg/kg	50.8	13,600	No	167	No	No
J_Deep	C8100	B2C1N0	202	204	Strontium	µg/kg	26,100	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Sulfate	µg/kg	80,100	—	ND	237,000	No	No
J_Deep	C8100	B2C1N0	202	204	Thallium	µg/kg	55.9	712	No	185	No	No
J_Deep	C8100	B2C1N0	202	204	Tin	µg/kg	3,810	48,038,400	No	—	ND	No
J_Deep	C8100	B2C1N0	202	204	Vanadium	µg/kg	39,000	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1N0	202	204	Zinc	µg/kg	32,200	5,971,200	No	67,800	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Aluminum	µg/kg	6,380,000	480,064,000	No	11,800,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Antimony	µg/kg	121	5,424	No	130	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Arsenic	µg/kg	2,160	2,920	No	20,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Barium	µg/kg	60,000	1,648,000	No	132,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Beryllium	µg/kg	119	63,216	No	1,510	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Cadmium	µg/kg	78	690	No	563	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Chloride	µg/kg	14,000	—	ND	100,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Chromium	µg/kg	27,400	480,096,000	No	18,500	Yes	No
J_Deep	C8100	B2C1N1	222.8	224.8	Cobalt	µg/kg	5,800	4,339	Yes	15,700	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Copper	µg/kg	13,700	284,160	No	22,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Fluoride	µg/kg	1,140	2,883,840	No	2,810	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Hexavalent Chromium	µg/kg	27,400	192	Yes	18,500	Yes	Yes
J_Deep	C8100	B2C1N1	222.8	224.8	Iron	µg/kg	18,000,000	5,644,800	Yes	32,600,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Lead	µg/kg	2,550	3,000,060	No	10,200	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Lithium	µg/kg	7,120	192,128	No	13,300	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Manganese	µg/kg	239,000	500,736	No	512,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Molybdenum	µg/kg	3,580	32,320	No	470	Yes	No
J_Deep	C8100	B2C1N1	222.8	224.8	Nickel	µg/kg	16,500	130,400	No	19,100	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Nitrate	µg/kg	7,590	—	ND	52,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Phosphorus	µg/kg	563,000	—	ND	—	ND	No
J_Deep	C8100	B2C1N1	222.8	224.8	Silver	µg/kg	50.7	13,600	No	167	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Strontium	µg/kg	27,700	6,758,400	No	—	ND	No
J_Deep	C8100	B2C1N1	222.8	224.8	Sulfate	µg/kg	95,800	—	ND	237,000	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Thallium	µg/kg	60.8	712	No	185	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Tin	µg/kg	5,490	48,038,400	No	—	ND	No
J_Deep	C8100	B2C1N1	222.8	224.8	Vanadium	µg/kg	46,600	1,600,320	No	85,100	No	No
J_Deep	C8100	B2C1N1	222.8	224.8	Zinc	µg/kg	31,500	5,971,200	No	67,800	No	No
J_Shallow	C8100	B2B1L6	0	1	Aluminum	µg/kg	7,740,000	480,064,000	No	11,800,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Antimony	µg/kg	219	5,424	No	130	Yes	No
J_Shallow	C8100	B2B1L6	0	1	Arsenic	µg/kg	3,270	2,920	Yes	20,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Barium	µg/kg	244,000	1,648,000	No	132,000	Yes	No
J_Shallow	C8100	B2B1L6	0	1	Beryllium	µg/kg	328	63,216	No	1,510	No	No
J_Shallow	C8100	B2B1L6	0	1	Cadmium	µg/kg	102	690	No	563	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 48 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Shallow	C8100	B2B1L6	0	1	Chloride	µg/kg	354	—	ND	100,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Chromium	µg/kg	10,500	480,096,000	No	18,500	No	No
J_Shallow	C8100	B2B1L6	0	1	Cobalt	µg/kg	6,340	4,339	Yes	15,700	No	No
J_Shallow	C8100	B2B1L6	0	1	Fluoride	µg/kg	502	2,883,840	No	2,810	No	No
J_Shallow	C8100	B2B1L6	0	1	Hexavalent Chromium	µg/kg	10,500	192	Yes	18,500	No	No
J_Shallow	C8100	B2B1L6	0	1	Iron	µg/kg	18,700,000	5,644,800	Yes	32,600,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Lead	µg/kg	5,290	3,000,060	No	10,200	No	No
J_Shallow	C8100	B2B1L6	0	1	Lithium	µg/kg	8,680	192,128	No	13,300	No	No
J_Shallow	C8100	B2B1L6	0	1	Nickel	µg/kg	13,700	130,400	No	19,100	No	No
J_Shallow	C8100	B2B1L6	0	1	Nitrate	µg/kg	3,240	—	ND	52,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Phosphorus	µg/kg	763,000	—	ND	—	ND	No
J_Shallow	C8100	B2B1L6	0	1	Silver	µg/kg	62.4	13,600	No	167	No	No
J_Shallow	C8100	B2B1L6	0	1	Strontium	µg/kg	125,000	6,758,400	No	—	ND	No
J_Shallow	C8100	B2B1L6	0	1	Sulfate	µg/kg	2,940	—	ND	237,000	No	No
J_Shallow	C8100	B2B1L6	0	1	Tin	µg/kg	3,030	48,038,400	No	—	ND	No
J_Shallow	C8100	B2B1L6	0	1	Vanadium	µg/kg	41,900	1,600,320	No	85,100	No	No
J_Shallow	C8100	B2B1L6	0	1	Zinc	µg/kg	34,300	5,971,200	No	67,800	No	No
J_Shallow	C8100	B2B1L7	0	1	Copper	µg/kg	12,100	284,160	No	22,000	No	No
J_Shallow	C8100	B2B1L7	0	1	Manganese	µg/kg	287,000	500,736	No	512,000	No	No
J_Shallow	C8100	B2B1L7	0	1	Mercury	µg/kg	16.2	2,090	No	13.1	Yes	No
J_Shallow	C8100	B2B1L7	0	1	Nitrite	µg/kg	1,550	—	ND	—	ND	No
J_Shallow	C8100	B2B1L7	0	1	Thallium	µg/kg	67.4	712	No	185	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Aluminum	µg/kg	6,890,000	480,064,000	No	11,800,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Antimony	µg/kg	233	5,424	No	130	Yes	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Arsenic	µg/kg	5,290	2,920	Yes	20,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Barium	µg/kg	79,500	1,648,000	No	132,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Beryllium	µg/kg	160	63,216	No	1,510	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Cadmium	µg/kg	113	690	No	563	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Chloride	µg/kg	677	—	ND	100,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Chromium	µg/kg	11,600	480,096,000	No	18,500	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Cobalt	µg/kg	6,950	4,339	Yes	15,700	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Copper	µg/kg	12,200	284,160	No	22,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Di-n-octylphthalate	µg/kg	159	266,240,641	No	—	ND	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Fluoride	µg/kg	1,040	2,883,840	No	2,810	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Hexavalent Chromium	µg/kg	11,600	192	Yes	18,500	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Iron	µg/kg	21,600,000	5,644,800	Yes	32,600,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Lead	µg/kg	4,900	3,000,060	No	10,200	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Lithium	µg/kg	7,460	192,128	No	13,300	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Manganese	µg/kg	340,000	500,736	No	512,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Nickel	µg/kg	10,200	130,400	No	19,100	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Nitrate	µg/kg	9,230	—	ND	52,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Nitrite	µg/kg	2,500	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 49 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
J_Shallow	C8100	B2C1M2	5.7	7.7	Phosphorus	µg/kg	902,000	—	ND	—	ND	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Silver	µg/kg	57.7	13,600	No	167	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Strontium	µg/kg	33,100	6,758,400	No	—	ND	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Sulfate	µg/kg	6,620	—	ND	237,000	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Thallium	µg/kg	82.3	712	No	185	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Tin	µg/kg	3,600	48,038,400	No	—	ND	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Vanadium	µg/kg	47,700	1,600,320	No	85,100	No	No
J_Shallow	C8100	B2C1M2	5.7	7.7	Zinc	µg/kg	43,400	5,971,200	No	67,800	No	No
J_Shallow	C8100	B2C1M3	15	19	Aluminum	µg/kg	6,910,000	480,064,000	No	11,800,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Antimony	µg/kg	2,160	5,424	No	130	Yes	No
J_Shallow	C8100	B2C1M3	15	19	Arsenic	µg/kg	7,890	2,920	Yes	20,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Barium	µg/kg	77,800	1,648,000	No	132,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Beryllium	µg/kg	134	63,216	No	1,510	No	No
J_Shallow	C8100	B2C1M3	15	19	Bis(2-ethylhexyl) phthalate	µg/kg	2,070	13,359	No	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Butylbenzylphthalate	µg/kg	77.8	12,845	No	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Cadmium	µg/kg	84	690	No	563	No	No
J_Shallow	C8100	B2C1M3	15	19	Chloride	µg/kg	3,140	—	ND	100,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Chromium	µg/kg	9,580	480,096,000	No	18,500	No	No
J_Shallow	C8100	B2C1M3	15	19	Cobalt	µg/kg	8,270	4,339	Yes	15,700	No	No
J_Shallow	C8100	B2C1M3	15	19	Copper	µg/kg	13,800	284,160	No	22,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Di-n-octylphthalate	µg/kg	89.5	266,240,641	No	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Fluoride	µg/kg	1,530	2,883,840	No	2,810	No	No
J_Shallow	C8100	B2C1M3	15	19	Hexavalent Chromium	µg/kg	9,580	192	Yes	18,500	No	No
J_Shallow	C8100	B2C1M3	15	19	Iron	µg/kg	24,100,000	5,644,800	Yes	32,600,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Lead	µg/kg	5,000	3,000,060	No	10,200	No	No
J_Shallow	C8100	B2C1M3	15	19	Lithium	µg/kg	7,300	192,128	No	13,300	No	No
J_Shallow	C8100	B2C1M3	15	19	Manganese	µg/kg	383,000	500,736	No	512,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Mercury	µg/kg	11.5	2,090	No	13.1	No	No
J_Shallow	C8100	B2C1M3	15	19	Nickel	µg/kg	10,700	130,400	No	19,100	No	No
J_Shallow	C8100	B2C1M3	15	19	Nitrate	µg/kg	8,920	—	ND	52,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Nitrite	µg/kg	1,220	—	ND	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Phosphorus	µg/kg	858,000	—	ND	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Silver	µg/kg	58.8	13,600	No	167	No	No
J_Shallow	C8100	B2C1M3	15	19	Strontium	µg/kg	33,800	6,758,400	No	—	ND	No
J_Shallow	C8100	B2C1M3	15	19	Sulfate	µg/kg	44,100	—	ND	237,000	No	No
J_Shallow	C8100	B2C1M3	15	19	Thallium	µg/kg	81.7	712	No	185	No	No
J_Shallow	C8100	B2C1M3	15	19	Vanadium	µg/kg	54,300	1,600,320	No	85,100	No	No
J_Shallow	C8100	B2C1M3	15	19	Zinc	µg/kg	52,300	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Aluminum	µg/kg	4,560,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Arsenic	µg/kg	1,700	2,920	No	20,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Barium	µg/kg	50,200	1,648,000	No	132,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Cadmium	µg/kg	51	690	No	563	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 50 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Chloride	µg/kg	1,400	—	ND	100,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Chromium	µg/kg	9,610	480,096,000	No	18,500	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Cobalt	µg/kg	6,290	4,339	Yes	15,700	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Copper	µg/kg	7,790	284,160	No	22,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Fluoride	µg/kg	1,520	2,883,840	No	2,810	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Hexavalent Chromium	µg/kg	9,610	192	Yes	18,500	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Iron	µg/kg	13,600,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Lead	µg/kg	2,580	3,000,060	No	10,200	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Lithium	µg/kg	5,840	192,128	No	13,300	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Manganese	µg/kg	294,000	500,736	No	512,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Nickel	µg/kg	11,000	130,400	No	19,100	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Nitrate	µg/kg	7,780	—	ND	52,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Phosphorus	µg/kg	497,000	—	ND	—	ND	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Silver	µg/kg	38.6	13,600	No	167	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Strontium	µg/kg	32,500	6,758,400	No	—	ND	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Sulfate	µg/kg	12,100	—	ND	237,000	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Thallium	µg/kg	60.2	712	No	185	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Vanadium	µg/kg	39,600	1,600,320	No	85,100	No	No
L1+L2_Deep	C7466	B20XX5	43.5	45.5	Zinc	µg/kg	26,900	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B20XX7	43.5	44.5	Acetone	µg/kg	3.08	28,903	No	—	ND	No
L1+L2_Deep	C7466	B211W3	84	86	Aluminum	µg/kg	5,280,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Antimony	µg/kg	198	5,424	No	130	Yes	No
L1+L2_Deep	C7466	B211W3	84	86	Arsenic	µg/kg	2,720	2,920	No	20,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Barium	µg/kg	54,000	1,648,000	No	132,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Beryllium	µg/kg	212	63,216	No	1,510	No	No
L1+L2_Deep	C7466	B211W3	84	86	Bis(2-ethylhexyl) phthalate	µg/kg	1,360	13,359	No	—	ND	No
L1+L2_Deep	C7466	B211W3	84	86	Cadmium	µg/kg	61.9	690	No	563	No	No
L1+L2_Deep	C7466	B211W3	84	86	Chloride	µg/kg	1,090	—	ND	100,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Chromium	µg/kg	13,000	480,096,000	No	18,500	No	No
L1+L2_Deep	C7466	B211W3	84	86	Cobalt	µg/kg	5,610	4,339	Yes	15,700	No	No
L1+L2_Deep	C7466	B211W3	84	86	Copper	µg/kg	8,510	284,160	No	22,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Fluoride	µg/kg	1,200	2,883,840	No	2,810	No	No
L1+L2_Deep	C7466	B211W3	84	86	Hexavalent Chromium	µg/kg	13,000	192	Yes	18,500	No	No
L1+L2_Deep	C7466	B211W3	84	86	Iron	µg/kg	13,600,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Lead	µg/kg	5,610	3,000,060	No	10,200	No	No
L1+L2_Deep	C7466	B211W3	84	86	Lithium	µg/kg	8,090	192,128	No	13,300	No	No
L1+L2_Deep	C7466	B211W3	84	86	Manganese	µg/kg	250,000	500,736	No	512,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Nickel	µg/kg	12,800	130,400	No	19,100	No	No
L1+L2_Deep	C7466	B211W3	84	86	Nitrate	µg/kg	4,980	—	ND	52,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Phosphorus	µg/kg	463,000	—	ND	—	ND	No
L1+L2_Deep	C7466	B211W3	84	86	Silver	µg/kg	57	13,600	No	167	No	No
L1+L2_Deep	C7466	B211W3	84	86	Strontium	µg/kg	28,700	6,758,400	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 51 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7466	B211W3	84	86	Sulfate	µg/kg	11,800	—	ND	237,000	No	No
L1+L2_Deep	C7466	B211W3	84	86	Thallium	µg/kg	72.7	712	No	185	No	No
L1+L2_Deep	C7466	B211W3	84	86	Vanadium	µg/kg	35,000	1,600,320	No	85,100	No	No
L1+L2_Deep	C7466	B211W3	84	86	Zinc	µg/kg	29,400	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B211W5	84	86	Acetone	µg/kg	9.43	28,903	No	—	ND	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Aluminum	µg/kg	5,600,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Arsenic	µg/kg	2,800	2,920	No	20,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Barium	µg/kg	47,400	1,648,000	No	132,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Beryllium	µg/kg	179	63,216	No	1,510	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Cadmium	µg/kg	55.1	690	No	563	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Chloride	µg/kg	1,450	—	ND	100,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Chromium	µg/kg	14,100	480,096,000	No	18,500	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Cobalt	µg/kg	5,290	4,339	Yes	15,700	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Copper	µg/kg	7,370	284,160	No	22,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Fluoride	µg/kg	780	2,883,840	No	2,810	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Hexavalent Chromium	µg/kg	14,100	192	Yes	18,500	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Iron	µg/kg	13,100,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Lead	µg/kg	4,470	3,000,060	No	10,200	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Lithium	µg/kg	9,590	192,128	No	13,300	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Manganese	µg/kg	205,000	500,736	No	512,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Nickel	µg/kg	11,800	130,400	No	19,100	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Nitrate	µg/kg	87,800	—	ND	52,000	Yes	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Nitrite	µg/kg	3,890	—	ND	—	ND	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Phosphorus	µg/kg	460,000	—	ND	—	ND	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Silver	µg/kg	53.5	13,600	No	167	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Strontium	µg/kg	21,900	6,758,400	No	—	ND	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Sulfate	µg/kg	53,300	—	ND	237,000	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Thallium	µg/kg	66.1	712	No	185	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Vanadium	µg/kg	38,600	1,600,320	No	85,100	No	No
L1+L2_Deep	C7466	B211W6	109.5	111.5	Zinc	µg/kg	26,600	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B211W8	109.5	111.5	Acetone	µg/kg	11.9	28,903	No	—	ND	No
L1+L2_Deep	C7466	B211W9	114	116	Aluminum	µg/kg	4,960,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Arsenic	µg/kg	3,260	2,920	Yes	20,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Barium	µg/kg	51,100	1,648,000	No	132,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Beryllium	µg/kg	188	63,216	No	1,510	No	No
L1+L2_Deep	C7466	B211W9	114	116	Cadmium	µg/kg	54.4	690	No	563	No	No
L1+L2_Deep	C7466	B211W9	114	116	Chloride	µg/kg	1,490	—	ND	100,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Chromium	µg/kg	14,200	480,096,000	No	18,500	No	No
L1+L2_Deep	C7466	B211W9	114	116	Cobalt	µg/kg	5,850	4,339	Yes	15,700	No	No
L1+L2_Deep	C7466	B211W9	114	116	Copper	µg/kg	7,980	284,160	No	22,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Fluoride	µg/kg	1,270	2,883,840	No	2,810	No	No
L1+L2_Deep	C7466	B211W9	114	116	Hexavalent Chromium	µg/kg	14,200	192	Yes	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 52 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7466	B211W9	114	116	Iron	µg/kg	14,200,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Lead	µg/kg	4,830	3,000,060	No	10,200	No	No
L1+L2_Deep	C7466	B211W9	114	116	Lithium	µg/kg	8,280	192,128	No	13,300	No	No
L1+L2_Deep	C7466	B211W9	114	116	Manganese	µg/kg	238,000	500,736	No	512,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Nickel	µg/kg	12,900	130,400	No	19,100	No	No
L1+L2_Deep	C7466	B211W9	114	116	Nitrate	µg/kg	90,300	—	ND	52,000	Yes	No
L1+L2_Deep	C7466	B211W9	114	116	Nitrite	µg/kg	3,980	—	ND	—	ND	No
L1+L2_Deep	C7466	B211W9	114	116	Phosphorus	µg/kg	430,000	—	ND	—	ND	No
L1+L2_Deep	C7466	B211W9	114	116	Silver	µg/kg	52.8	13,600	No	167	No	No
L1+L2_Deep	C7466	B211W9	114	116	Strontium	µg/kg	23,700	6,758,400	No	—	ND	No
L1+L2_Deep	C7466	B211W9	114	116	Sulfate	µg/kg	43,100	—	ND	237,000	No	No
L1+L2_Deep	C7466	B211W9	114	116	Thallium	µg/kg	79	712	No	185	No	No
L1+L2_Deep	C7466	B211W9	114	116	Vanadium	µg/kg	27,800	1,600,320	No	85,100	No	No
L1+L2_Deep	C7466	B211W9	114	116	Zinc	µg/kg	27,400	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B211X1	114	116	Styrene	µg/kg	0.506	2,244	No	—	ND	No
L1+L2_Deep	C7466	B211X2	133	135	Aluminum	µg/kg	6,370,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Arsenic	µg/kg	2,210	2,920	No	20,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Barium	µg/kg	67,100	1,648,000	No	132,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Beryllium	µg/kg	209	63,216	No	1,510	No	No
L1+L2_Deep	C7466	B211X2	133	135	Bis(2-ethylhexyl) phthalate	µg/kg	1,260	13,359	No	—	ND	No
L1+L2_Deep	C7466	B211X2	133	135	Cadmium	µg/kg	58.8	690	No	563	No	No
L1+L2_Deep	C7466	B211X2	133	135	Chloride	µg/kg	1,830	—	ND	100,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Chromium	µg/kg	16,600	480,096,000	No	18,500	No	No
L1+L2_Deep	C7466	B211X2	133	135	Cobalt	µg/kg	4,590	4,339	Yes	15,700	No	No
L1+L2_Deep	C7466	B211X2	133	135	Copper	µg/kg	11,700	284,160	No	22,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Fluoride	µg/kg	1,280	2,883,840	No	2,810	No	No
L1+L2_Deep	C7466	B211X2	133	135	Hexavalent Chromium	µg/kg	16,600	192	Yes	18,500	No	No
L1+L2_Deep	C7466	B211X2	133	135	Iron	µg/kg	15,300,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Lead	µg/kg	4,190	3,000,060	No	10,200	No	No
L1+L2_Deep	C7466	B211X2	133	135	Lithium	µg/kg	9,190	192,128	No	13,300	No	No
L1+L2_Deep	C7466	B211X2	133	135	Manganese	µg/kg	221,000	500,736	No	512,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Nickel	µg/kg	8,920	130,400	No	19,100	No	No
L1+L2_Deep	C7466	B211X2	133	135	Nitrate	µg/kg	35,300	—	ND	52,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Nitrite	µg/kg	4,710	—	ND	—	ND	No
L1+L2_Deep	C7466	B211X2	133	135	Phosphorus	µg/kg	479,000	—	ND	—	ND	No
L1+L2_Deep	C7466	B211X2	133	135	Silver	µg/kg	58	13,600	No	167	No	No
L1+L2_Deep	C7466	B211X2	133	135	Strontium	µg/kg	30,700	6,758,400	No	—	ND	No
L1+L2_Deep	C7466	B211X2	133	135	Sulfate	µg/kg	57,200	—	ND	237,000	No	No
L1+L2_Deep	C7466	B211X2	133	135	Thallium	µg/kg	73.5	712	No	185	No	No
L1+L2_Deep	C7466	B211X2	133	135	Vanadium	µg/kg	38,900	1,600,320	No	85,100	No	No
L1+L2_Deep	C7466	B211X2	133	135	Zinc	µg/kg	28,800	5,971,200	No	67,800	No	No
L1+L2_Deep	C7466	B211X4	133	135	Styrene	µg/kg	0.443	2,244	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 53 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7670	B23KP9	39	41	Aluminum	µg/kg	8,530,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Antimony	µg/kg	122	5,424	No	130	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Arsenic	µg/kg	2,290	2,920	No	20,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Barium	µg/kg	78,400	1,648,000	No	132,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Beryllium	µg/kg	173	63,216	No	1,510	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Cadmium	µg/kg	68.5	690	No	563	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Chloride	µg/kg	964	—	ND	100,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Chromium	µg/kg	17,700	480,096,000	No	18,500	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Cobalt	µg/kg	8,250	4,339	Yes	15,700	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Copper	µg/kg	11,500	284,160	No	22,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Fluoride	µg/kg	1,730	2,883,840	No	2,810	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Hexavalent Chromium	µg/kg	17,700	192	Yes	18,500	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Iron	µg/kg	19,500,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Lead	µg/kg	3,410	3,000,060	No	10,200	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Lithium	µg/kg	9,530	192,128	No	13,300	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Manganese	µg/kg	353,000	500,736	No	512,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Nickel	µg/kg	20,200	130,400	No	19,100	Yes	No
L1+L2_Deep	C7670	B23KP9	39	41	Nitrate	µg/kg	11,100	—	ND	52,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Nitrite	µg/kg	1,690	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KP9	39	41	Phosphorus	µg/kg	601,000	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KP9	39	41	Silver	µg/kg	58.2	13,600	No	167	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Strontium	µg/kg	46,100	6,758,400	No	—	ND	No
L1+L2_Deep	C7670	B23KP9	39	41	Sulfate	µg/kg	11,700	—	ND	237,000	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Thallium	µg/kg	81.6	712	No	185	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Vanadium	µg/kg	45,700	1,600,320	No	85,100	No	No
L1+L2_Deep	C7670	B23KP9	39	41	Zinc	µg/kg	36,700	5,971,200	No	67,800	No	No
L1+L2_Deep	C7670	B23KR1	39	41	Acetone	µg/kg	72.5	28,903	No	—	ND	No
L1+L2_Deep	C7670	B23KR2	139	141	Aluminum	µg/kg	7,170,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Antimony	µg/kg	169	5,424	No	130	Yes	No
L1+L2_Deep	C7670	B23KR2	139	141	Arsenic	µg/kg	2,900	2,920	No	20,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Barium	µg/kg	64,500	1,648,000	No	132,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Beryllium	µg/kg	149	63,216	No	1,510	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Cadmium	µg/kg	62.9	690	No	563	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Chloride	µg/kg	3,260	—	ND	100,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Chromium	µg/kg	22,000	480,096,000	No	18,500	Yes	No
L1+L2_Deep	C7670	B23KR2	139	141	Cobalt	µg/kg	5,650	4,339	Yes	15,700	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Copper	µg/kg	9,180	284,160	No	22,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Fluoride	µg/kg	1,410	2,883,840	No	2,810	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Hexavalent Chromium	µg/kg	22,000	192	Yes	18,500	Yes	Yes
L1+L2_Deep	C7670	B23KR2	139	141	Iron	µg/kg	17,500,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Lead	µg/kg	13,800	3,000,060	No	10,200	Yes	No
L1+L2_Deep	C7670	B23KR2	139	141	Lithium	µg/kg	9,270	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 54 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7670	B23KR2	139	141	Manganese	µg/kg	291,000	500,736	No	512,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Nickel	µg/kg	10,900	130,400	No	19,100	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Nitrate	µg/kg	41,800	—	ND	52,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Nitrite	µg/kg	1,040	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KR2	139	141	Phosphorus	µg/kg	452,000	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KR2	139	141	Silver	µg/kg	46.6	13,600	No	167	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Strontium	µg/kg	36,100	6,758,400	No	—	ND	No
L1+L2_Deep	C7670	B23KR2	139	141	Sulfate	µg/kg	113,000	—	ND	237,000	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Thallium	µg/kg	78.8	712	No	185	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Vanadium	µg/kg	36,800	1,600,320	No	85,100	No	No
L1+L2_Deep	C7670	B23KR2	139	141	Zinc	µg/kg	33,800	5,971,200	No	67,800	No	No
L1+L2_Deep	C7670	B23KR4	139	141	Toluene	µg/kg	0.331	4,654	No	—	ND	No
L1+L2_Deep	C7670	B23KR5	163	165	Aluminum	µg/kg	7,170,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Antimony	µg/kg	159	5,424	No	130	Yes	No
L1+L2_Deep	C7670	B23KR5	163	165	Arsenic	µg/kg	2,800	2,920	No	20,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Barium	µg/kg	68,800	1,648,000	No	132,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Beryllium	µg/kg	135	63,216	No	1,510	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Cadmium	µg/kg	64	690	No	563	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Chloride	µg/kg	8,450	—	ND	100,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Chromium	µg/kg	23,500	480,096,000	No	18,500	Yes	No
L1+L2_Deep	C7670	B23KR5	163	165	Cobalt	µg/kg	6,930	4,339	Yes	15,700	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Copper	µg/kg	11,500	284,160	No	22,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Fluoride	µg/kg	780	2,883,840	No	2,810	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Hexavalent Chromium	µg/kg	23,500	192	Yes	18,500	Yes	Yes
L1+L2_Deep	C7670	B23KR5	163	165	Iron	µg/kg	20,200,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Lead	µg/kg	5,410	3,000,060	No	10,200	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Lithium	µg/kg	8,380	192,128	No	13,300	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Manganese	µg/kg	282,000	500,736	No	512,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Nickel	µg/kg	14,700	130,400	No	19,100	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Nitrate	µg/kg	6,680	—	ND	52,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Nitrite	µg/kg	982	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KR5	163	165	Phosphorus	µg/kg	596,000	—	ND	—	ND	No
L1+L2_Deep	C7670	B23KR5	163	165	Silver	µg/kg	62.4	13,600	No	167	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Strontium	µg/kg	29,400	6,758,400	No	—	ND	No
L1+L2_Deep	C7670	B23KR5	163	165	Sulfate	µg/kg	66,500	—	ND	237,000	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Thallium	µg/kg	65.9	712	No	185	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Vanadium	µg/kg	48,800	1,600,320	No	85,100	No	No
L1+L2_Deep	C7670	B23KR5	163	165	Zinc	µg/kg	35,500	5,971,200	No	67,800	No	No
L1+L2_Deep	C7670	B23KR7	163	165	Toluene	µg/kg	0.314	4,654	No	—	ND	No
L1+L2_Deep	C7670	B23KT3	222	224	Acetone	µg/kg	21.5	28,903	No	—	ND	No
L1+L2_Deep	C7670	B23KT3	222	224	Benzene	µg/kg	0.395	28.2	No	—	ND	No
L1+L2_Deep	C7670	B23KT3	222	224	Toluene	µg/kg	0.325	4,654	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 55 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Deep	C7670	B25ND7	220	224	Aluminum	µg/kg	8,440,000	480,064,000	No	11,800,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Antimony	µg/kg	247	5,424	No	130	Yes	No
L1+L2_Deep	C7670	B25ND7	220	224	Arsenic	µg/kg	2,590	2,920	No	20,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Barium	µg/kg	66,300	1,648,000	No	132,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Cadmium	µg/kg	37.7	690	No	563	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Chloride	µg/kg	6,430	—	ND	100,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Chromium	µg/kg	32,200	480,096,000	No	18,500	Yes	No
L1+L2_Deep	C7670	B25ND7	220	224	Cobalt	µg/kg	8,840	4,339	Yes	15,700	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Copper	µg/kg	27,100	284,160	No	22,000	Yes	No
L1+L2_Deep	C7670	B25ND7	220	224	Di-n-octylphthalate	µg/kg	1,220	266,240,641	No	—	ND	No
L1+L2_Deep	C7670	B25ND7	220	224	Fluoride	µg/kg	2,380	2,883,840	No	2,810	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Hexavalent Chromium	µg/kg	32,200	192	Yes	18,500	Yes	Yes
L1+L2_Deep	C7670	B25ND7	220	224	Iron	µg/kg	23,300,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Lead	µg/kg	3,750	3,000,060	No	10,200	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Lithium	µg/kg	8,700	192,128	No	13,300	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Manganese	µg/kg	320,000	500,736	No	512,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Mercury	µg/kg	68.1	2,090	No	13.1	Yes	No
L1+L2_Deep	C7670	B25ND7	220	224	Molybdenum	µg/kg	5,120	32,320	No	470	Yes	No
L1+L2_Deep	C7670	B25ND7	220	224	Nickel	µg/kg	12,900	130,400	No	19,100	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Nitrate	µg/kg	12,100	—	ND	52,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Nitrite	µg/kg	2,470	—	ND	—	ND	No
L1+L2_Deep	C7670	B25ND7	220	224	Phosphorus	µg/kg	613,000	—	ND	—	ND	No
L1+L2_Deep	C7670	B25ND7	220	224	Silver	µg/kg	33.7	13,600	No	167	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Strontium	µg/kg	30,300	6,758,400	No	—	ND	No
L1+L2_Deep	C7670	B25ND7	220	224	Sulfate	µg/kg	116,000	28	Yes	237,000	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Thallium	µg/kg	57.8	712	No	185	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Vanadium	µg/kg	60,000	1,600,320	No	85,100	No	No
L1+L2_Deep	C7670	B25ND7	220	224	Zinc	µg/kg	52,700	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Arsenic	µg/kg	4,070	2,920	Yes	20,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Barium	µg/kg	106,000	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	beta-BHC	µg/kg	19	2.3	Yes	—	ND	Yes
L1+L2_Shallow	C7466	B20XW6	5	7	Bis(2-ethylhexyl) phthalate	µg/kg	1,840	13,359	No	—	ND	No
L1+L2_Shallow	C7466	B20XW6	5	7	Cadmium	µg/kg	104	690	No	563	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Chloride	µg/kg	1,920	—	ND	100,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Chromium	µg/kg	11,100	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Cobalt	µg/kg	10,700	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Copper	µg/kg	15,100	284,160	No	22,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Fluoride	µg/kg	1,660	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Hexavalent Chromium	µg/kg	11,100	192	Yes	18,500	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Iron	µg/kg	25,900,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Lead	µg/kg	4,960	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Lithium	µg/kg	7,440	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 56 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Shallow	C7466	B20XW6	5	7	Manganese	µg/kg	450,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Nickel	µg/kg	13,100	130,400	No	19,100	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Nitrate	µg/kg	12,000	—	ND	52,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Nitrite	µg/kg	2,540	—	ND	—	ND	No
L1+L2_Shallow	C7466	B20XW6	5	7	Phosphorus	µg/kg	1,140,000	—	ND	—	ND	No
L1+L2_Shallow	C7466	B20XW6	5	7	Silver	µg/kg	102	13,600	No	167	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Strontium	µg/kg	32,700	6,758,400	No	—	ND	No
L1+L2_Shallow	C7466	B20XW6	5	7	Sulfate	µg/kg	9,620	28	Yes	237,000	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Thallium	µg/kg	133	712	No	185	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Vanadium	µg/kg	66,700	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7466	B20XW6	5	7	Zinc	µg/kg	43,400	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Aluminum	µg/kg	5,410,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Arsenic	µg/kg	1,800	2,920	No	20,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Barium	µg/kg	46,600	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	beta-BHC	µg/kg	20	2.3	Yes	—	ND	Yes
L1+L2_Shallow	C7466	B20XW9	10	12	Cadmium	µg/kg	32.3	690	No	563	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Chloride	µg/kg	315	—	ND	100,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Chromium	µg/kg	7,540	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Cobalt	µg/kg	4,340	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Copper	µg/kg	8,020	284,160	No	22,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Fluoride	µg/kg	688	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Hexavalent Chromium	µg/kg	7,540	192	Yes	18,500	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Iron	µg/kg	12,600,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Lead	µg/kg	3,040	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Lithium	µg/kg	6,820	192,128	No	13,300	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Manganese	µg/kg	169,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Nickel	µg/kg	7,330	130,400	No	19,100	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Nitrate	µg/kg	3,640	—	ND	52,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Nitrite	µg/kg	5,180	—	ND	—	ND	No
L1+L2_Shallow	C7466	B20XW9	10	12	Phosphorus	µg/kg	522,000	—	ND	—	ND	No
L1+L2_Shallow	C7466	B20XW9	10	12	Silver	µg/kg	52	13,600	No	167	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Strontium	µg/kg	26,300	6,758,400	No	—	ND	No
L1+L2_Shallow	C7466	B20XW9	10	12	Sulfate	µg/kg	2,010	28	Yes	237,000	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Vanadium	µg/kg	35,500	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7466	B20XW9	10	12	Zinc	µg/kg	24,200	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Aluminum	µg/kg	5,110,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Arsenic	µg/kg	2,030	2,920	No	20,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Barium	µg/kg	53,400	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	beta-BHC	µg/kg	22	2.3	Yes	—	ND	Yes
L1+L2_Shallow	C7466	B20XX2	14	16	Butylbenzylphthalate	µg/kg	53.6	12,845	No	—	ND	No
L1+L2_Shallow	C7466	B20XX2	14	16	Cadmium	µg/kg	60.3	690	No	563	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Chloride	µg/kg	419	—	ND	100,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 57 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Shallow	C7466	B20XX2	14	16	Chromium	µg/kg	8,500	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Cobalt	µg/kg	5,640	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Copper	µg/kg	9,650	284,160	No	22,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Fluoride	µg/kg	379	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Hexavalent Chromium	µg/kg	8,500	192	Yes	18,500	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Iron	µg/kg	16,800,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Lead	µg/kg	3,630	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Lithium	µg/kg	5,550	192,128	No	13,300	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Manganese	µg/kg	243,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Nickel	µg/kg	8,060	130,400	No	19,100	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Nitrate	µg/kg	1,920	—	ND	52,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Phosphorus	µg/kg	640,000	—	ND	—	ND	No
L1+L2_Shallow	C7466	B20XX2	14	16	Silver	µg/kg	65.9	13,600	No	167	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Strontium	µg/kg	19,000	6,758,400	No	—	ND	No
L1+L2_Shallow	C7466	B20XX2	14	16	Sulfate	µg/kg	1,850	28	Yes	237,000	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Vanadium	µg/kg	52,200	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7466	B20XX2	14	16	Zinc	µg/kg	29,100	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7466	B215K8	0	1	Cobalt	µg/kg	8,370	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7466	B215K8	0	1	Fluoride	µg/kg	567	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7466	B215K8	0	1	Nitrite	µg/kg	1,930	—	ND	—	ND	No
L1+L2_Shallow	C7466	B215K9	0	1	Aluminum	µg/kg	7,070,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Antimony	µg/kg	500	5,424	No	130	Yes	No
L1+L2_Shallow	C7466	B215K9	0	1	Arsenic	µg/kg	3,690	2,920	Yes	20,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Barium	µg/kg	84,700	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	beta-BHC	µg/kg	23	2.3	Yes	—	ND	Yes
L1+L2_Shallow	C7466	B215K9	0	1	Butylbenzylphthalate	µg/kg	59.2	12,845	No	—	ND	No
L1+L2_Shallow	C7466	B215K9	0	1	Cadmium	µg/kg	120	690	No	563	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Chloride	µg/kg	637	—	ND	100,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Chromium	µg/kg	7,960	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Copper	µg/kg	11,200	284,160	No	22,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Hexavalent Chromium	µg/kg	7,960	192	Yes	18,500	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Iron	µg/kg	22,300,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Lead	µg/kg	6,430	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Lithium	µg/kg	6,640	192,128	No	13,300	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Manganese	µg/kg	393,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Nickel	µg/kg	18,400	130,400	No	19,100	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Nitrate	µg/kg	6,000	—	ND	52,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Phosphorus	µg/kg	923,000	—	ND	—	ND	No
L1+L2_Shallow	C7466	B215K9	0	1	Silver	µg/kg	91.3	13,600	No	167	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Strontium	µg/kg	31,100	6,758,400	No	—	ND	No
L1+L2_Shallow	C7466	B215K9	0	1	Sulfate	µg/kg	1,710	28	Yes	237,000	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Thallium	µg/kg	125	712	No	185	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 58 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Shallow	C7466	B215K9	0	1	Vanadium	µg/kg	71,600	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7466	B215K9	0	1	Zinc	µg/kg	42,200	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Aluminum	µg/kg	5,590,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Antimony	µg/kg	96.8	5,424	No	130	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Arsenic	µg/kg	2,200	2,920	No	20,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Barium	µg/kg	70,100	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Beryllium	µg/kg	144	63,216	No	1,510	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Cadmium	µg/kg	61.1	690	No	563	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Chloride	µg/kg	560	—	ND	100,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Chromium	µg/kg	10,600	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Cobalt	µg/kg	5,320	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Copper	µg/kg	11,000	284,160	No	22,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Fluoride	µg/kg	1,110	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Hexavalent Chromium	µg/kg	10,600	192	Yes	18,500	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Iron	µg/kg	16,000,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Lead	µg/kg	3,080	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Lithium	µg/kg	6,320	192,128	No	13,300	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Manganese	µg/kg	241,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Nickel	µg/kg	10,600	130,400	No	19,100	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Nitrate	µg/kg	5,870	—	ND	52,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Nitrite	µg/kg	2,420	—	ND	—	ND	No
L1+L2_Shallow	C7670	B238J9	5	7	Phosphorus	µg/kg	799,000	—	ND	—	ND	No
L1+L2_Shallow	C7670	B238J9	5	7	Strontium	µg/kg	28,100	6,758,400	No	—	ND	No
L1+L2_Shallow	C7670	B238J9	5	7	Sulfate	µg/kg	7,350	28	Yes	237,000	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Vanadium	µg/kg	32,000	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7670	B238J9	5	7	Zinc	µg/kg	28,300	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Aluminum	µg/kg	6,710,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Arsenic	µg/kg	4,520	2,920	Yes	20,000	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Chromium	µg/kg	7,570	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Cobalt	µg/kg	8,810	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Fluoride	µg/kg	1,360	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Hexavalent Chromium	µg/kg	7,570	192	Yes	18,500	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Iron	µg/kg	20,100,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Lead	µg/kg	6,280	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Nickel	µg/kg	11,500	130,400	No	19,100	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Phosphorus	µg/kg	889,000	—	ND	—	ND	No
L1+L2_Shallow	C7670	B23KN7	0	1	Strontium	µg/kg	33,300	6,758,400	No	—	ND	No
L1+L2_Shallow	C7670	B23KN7	0	1	Vanadium	µg/kg	37,900	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7670	B23KN7	0	1	Zinc	µg/kg	36,800	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7670	B23KP2	10	12	Acetone	µg/kg	46.2	28,903	No	—	ND	No
L1+L2_Shallow	C7670	B23KP6	14	16	Aluminum	µg/kg	5,370,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Antimony	µg/kg	74.1	5,424	No	130	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 59 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Shallow	C7670	B23KP6	14	16	Arsenic	µg/kg	2,590	2,920	No	20,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Barium	µg/kg	55,400	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Beryllium	µg/kg	111	63,216	No	1,510	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Cadmium	µg/kg	54.6	690	No	563	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Chloride	µg/kg	625	—	ND	100,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Chromium	µg/kg	8,360	480,096,000	No	18,500	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Cobalt	µg/kg	5,500	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Copper	µg/kg	9,660	284,160	No	22,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Fluoride	µg/kg	1,130	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Hexavalent Chromium	µg/kg	8,360	192	Yes	18,500	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Iron	µg/kg	16,000,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Lead	µg/kg	3,520	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Lithium	µg/kg	6,850	192,128	No	13,300	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Manganese	µg/kg	259,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Mercury	µg/kg	17.1	2,090	No	13.1	Yes	No
L1+L2_Shallow	C7670	B23KP6	14	16	Molybdenum	µg/kg	2,260	32,320	No	470	Yes	No
L1+L2_Shallow	C7670	B23KP6	14	16	Nickel	µg/kg	7,700	130,400	No	19,100	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Nitrate	µg/kg	3,690	—	ND	52,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Nitrite	µg/kg	1,250	—	ND	—	ND	No
L1+L2_Shallow	C7670	B23KP6	14	16	Phosphorus	µg/kg	630,000	—	ND	—	ND	No
L1+L2_Shallow	C7670	B23KP6	14	16	Strontium	µg/kg	26,900	6,758,400	No	—	ND	No
L1+L2_Shallow	C7670	B23KP6	14	16	Sulfate	µg/kg	4,340	28	Yes	237,000	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Vanadium	µg/kg	33,500	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7670	B23KP6	14	16	Zinc	µg/kg	33,700	5,971,200	No	67,800	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Antimony	µg/kg	286	5,424	No	130	Yes	No
L1+L2_Shallow	C7670	B23R25	0	1	Barium	µg/kg	86,300	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Beryllium	µg/kg	216	63,216	No	1,510	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Cadmium	µg/kg	101	690	No	563	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Chloride	µg/kg	1,230	—	ND	100,000	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Copper	µg/kg	11,500	284,160	No	22,000	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Lithium	µg/kg	7,280	192,128	No	13,300	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Manganese	µg/kg	348,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Nitrate	µg/kg	4,080	—	ND	52,000	No	No
L1+L2_Shallow	C7670	B23R25	0	1	Sulfate	µg/kg	2,760	28	Yes	237,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Aluminum	µg/kg	5,250,000	480,064,000	No	11,800,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Antimony	µg/kg	80	5,424	No	130	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Arsenic	µg/kg	2,360	2,920	No	20,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Barium	µg/kg	51,100	1,648,000	No	132,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Beryllium	µg/kg	117	63,216	No	1,510	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Cadmium	µg/kg	72.5	690	No	563	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Chloride	µg/kg	327	—	ND	100,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Chromium	µg/kg	8,590	480,096,000	No	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 60 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
L1+L2_Shallow	C7670	B25CN2	10	14	Cobalt	µg/kg	5,450	4,339	Yes	15,700	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Copper	µg/kg	10,200	284,160	No	22,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Fluoride	µg/kg	940	2,883,840	No	2,810	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Hexavalent Chromium	µg/kg	8,590	192	Yes	18,500	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Iron	µg/kg	15,900,000	5,644,800	Yes	32,600,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Lead	µg/kg	4,270	3,000,060	No	10,200	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Lithium	µg/kg	6,500	192,128	No	13,300	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Manganese	µg/kg	238,000	500,736	No	512,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Mercury	µg/kg	10.2	2,090	No	13.1	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Molybdenum	µg/kg	2,450	32,320	No	470	Yes	No
L1+L2_Shallow	C7670	B25CN2	10	14	Nickel	µg/kg	8,180	130,400	No	19,100	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Nitrate	µg/kg	3,990	—	ND	52,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Nitrite	µg/kg	1,790	—	ND	—	ND	No
L1+L2_Shallow	C7670	B25CN2	10	14	Phosphorus	µg/kg	643,000	—	ND	—	ND	No
L1+L2_Shallow	C7670	B25CN2	10	14	Selenium	µg/kg	1,350	5,200	No	780	Yes	No
L1+L2_Shallow	C7670	B25CN2	10	14	Strontium	µg/kg	25,900	6,758,400	No	—	ND	No
L1+L2_Shallow	C7670	B25CN2	10	14	Sulfate	µg/kg	3,590	28	Yes	237,000	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Vanadium	µg/kg	32,600	1,600,320	No	85,100	No	No
L1+L2_Shallow	C7670	B25CN2	10	14	Zinc	µg/kg	29,300	5,971,200	No	67,800	No	No
P_Deep	C6392	B1YT72	19.5	21.5	Acetone	µg/kg	4.57	28,903	No	—	ND	No
P_Deep	C6392	B1YT72	19.5	21.5	Toluene	µg/kg	1.36	4,654	No	—	ND	No
P_Deep	C6392	B1YT74	19.5	21.5	Aluminum	µg/kg	4,900,000	480,064,000	No	11,800,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Arsenic	µg/kg	3,060	2,920	Yes	20,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Barium	µg/kg	65,800	1,648,000	No	132,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Chloride	µg/kg	731	—	ND	100,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Chromium	µg/kg	9,340	480,096,000	No	18,500	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Cobalt	µg/kg	7,150	4,339	Yes	15,700	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Copper	µg/kg	12,600	284,160	No	22,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Fluoride	µg/kg	2,630	2,883,840	No	2,810	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Hexavalent Chromium	µg/kg	9,340	192	Yes	18,500	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Iron	µg/kg	17,800,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Lead	µg/kg	4,260	3,000,060	No	10,200	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Lithium	µg/kg	6,120	192,128	No	13,300	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Manganese	µg/kg	274,000	500,736	No	512,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Nickel	µg/kg	9,580	130,400	No	19,100	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Nitrate	µg/kg	7,820	—	ND	52,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Phosphorus	µg/kg	625,000	—	ND	—	ND	No
P_Deep	C6392	B1YT74	19.5	21.5	Strontium	µg/kg	25,900	6,758,400	No	—	ND	No
P_Deep	C6392	B1YT74	19.5	21.5	Sulfate	µg/kg	9,350	28	Yes	237,000	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Thallium	µg/kg	72.7	712	No	185	No	No
P_Deep	C6392	B1YT74	19.5	21.5	Tin	µg/kg	13,000	48,038,400	No	—	ND	No
P_Deep	C6392	B1YT74	19.5	21.5	Vanadium	µg/kg	55,800	1,600,320	No	85,100	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 61 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6392	B1YT74	19.5	21.5	Zinc	µg/kg	33,600	5,971,200	No	67,800	No	No
P_Deep	C6392	B1YT77	25	27	Aluminum	µg/kg	6,390,000	480,064,000	No	11,800,000	No	No
P_Deep	C6392	B1YT77	25	27	Arsenic	µg/kg	2,220	2,920	No	20,000	No	No
P_Deep	C6392	B1YT77	25	27	Barium	µg/kg	79,200	1,648,000	No	132,000	No	No
P_Deep	C6392	B1YT77	25	27	Beryllium	µg/kg	217	63,216	No	1,510	No	No
P_Deep	C6392	B1YT77	25	27	Chloride	µg/kg	5,430	—	ND	100,000	No	No
P_Deep	C6392	B1YT77	25	27	Chromium	µg/kg	15,100	480,096,000	No	18,500	No	No
P_Deep	C6392	B1YT77	25	27	Cobalt	µg/kg	6,350	4,339	Yes	15,700	No	No
P_Deep	C6392	B1YT77	25	27	Copper	µg/kg	8,960	284,160	No	22,000	No	No
P_Deep	C6392	B1YT77	25	27	Fluoride	µg/kg	1,870	2,883,840	No	2,810	No	No
P_Deep	C6392	B1YT77	25	27	Hexavalent Chromium	µg/kg	15,100	192	Yes	18,500	No	No
P_Deep	C6392	B1YT77	25	27	Iron	µg/kg	14,300,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6392	B1YT77	25	27	Lead	µg/kg	3,620	3,000,060	No	10,200	No	No
P_Deep	C6392	B1YT77	25	27	Lithium	µg/kg	8,310	192,128	No	13,300	No	No
P_Deep	C6392	B1YT77	25	27	Manganese	µg/kg	285,000	500,736	No	512,000	No	No
P_Deep	C6392	B1YT77	25	27	Nickel	µg/kg	30,600	130,400	No	19,100	Yes	No
P_Deep	C6392	B1YT77	25	27	Nitrate	µg/kg	19,400	—	ND	52,000	No	No
P_Deep	C6392	B1YT77	25	27	Phosphorus	µg/kg	464,000	—	ND	—	ND	No
P_Deep	C6392	B1YT77	25	27	Strontium	µg/kg	33,100	6,758,400	No	—	ND	No
P_Deep	C6392	B1YT77	25	27	Sulfate	µg/kg	57,600	28	Yes	237,000	No	No
P_Deep	C6392	B1YT77	25	27	Thallium	µg/kg	79.7	712	No	185	No	No
P_Deep	C6392	B1YT77	25	27	Vanadium	µg/kg	37,700	1,600,320	No	85,100	No	No
P_Deep	C6392	B1YT77	25	27	Zinc	µg/kg	31,800	5,971,200	No	67,800	No	No
P_Deep	C6392	B1YT80	42	44	Aluminum	µg/kg	3,790,000	480,064,000	No	11,800,000	No	No
P_Deep	C6392	B1YT80	42	44	Arsenic	µg/kg	2,730	2,920	No	20,000	No	No
P_Deep	C6392	B1YT80	42	44	Barium	µg/kg	57,200	1,648,000	No	132,000	No	No
P_Deep	C6392	B1YT80	42	44	Bis(2-ethylhexyl) phthalate	µg/kg	5,050	13,359	No	—	ND	No
P_Deep	C6392	B1YT80	42	44	Chloride	µg/kg	2,380	—	ND	100,000	No	No
P_Deep	C6392	B1YT80	42	44	Chromium	µg/kg	12,600	480,096,000	No	18,500	No	No
P_Deep	C6392	B1YT80	42	44	Cobalt	µg/kg	4,620	4,339	Yes	15,700	No	No
P_Deep	C6392	B1YT80	42	44	Copper	µg/kg	6,830	284,160	No	22,000	No	No
P_Deep	C6392	B1YT80	42	44	Ethylene glycol	µg/kg	1,030	64,320	No	—	ND	No
P_Deep	C6392	B1YT80	42	44	Fluoride	µg/kg	760	2,883,840	No	2,810	No	No
P_Deep	C6392	B1YT80	42	44	Hexavalent Chromium	µg/kg	12,600	192	Yes	18,500	No	No
P_Deep	C6392	B1YT80	42	44	Iron	µg/kg	12,400,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6392	B1YT80	42	44	Lead	µg/kg	2,720	3,000,060	No	10,200	No	No
P_Deep	C6392	B1YT80	42	44	Lithium	µg/kg	5,350	192,128	No	13,300	No	No
P_Deep	C6392	B1YT80	42	44	Manganese	µg/kg	193,000	500,736	No	512,000	No	No
P_Deep	C6392	B1YT80	42	44	Nickel	µg/kg	9,350	130,400	No	19,100	No	No
P_Deep	C6392	B1YT80	42	44	Nitrate	µg/kg	4,400	—	ND	52,000	No	No
P_Deep	C6392	B1YT80	42	44	Phosphorus	µg/kg	510,000	—	ND	—	ND	No
P_Deep	C6392	B1YT80	42	44	Strontium	µg/kg	18,700	6,758,400	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 62 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6392	B1YT80	42	44	Sulfate	µg/kg	21,800	28	Yes	237,000	No	No
P_Deep	C6392	B1YT80	42	44	Vanadium	µg/kg	33,900	1,600,320	No	85,100	No	No
P_Deep	C6392	B1YT80	42	44	Zinc	µg/kg	25,400	5,971,200	No	67,800	No	No
P_Deep	C6392	B1YT83	56	58	Aluminum	µg/kg	5,300,000	480,064,000	No	11,800,000	No	No
P_Deep	C6392	B1YT83	56	58	Arsenic	µg/kg	2,650	2,920	No	20,000	No	No
P_Deep	C6392	B1YT83	56	58	Barium	µg/kg	62,500	1,648,000	No	132,000	No	No
P_Deep	C6392	B1YT83	56	58	Cadmium	µg/kg	63.7	690	No	563	No	No
P_Deep	C6392	B1YT83	56	58	Chloride	µg/kg	4,300	—	ND	100,000	No	No
P_Deep	C6392	B1YT83	56	58	Chromium	µg/kg	15,300	480,096,000	No	18,500	No	No
P_Deep	C6392	B1YT83	56	58	Cobalt	µg/kg	4,050	4,339	No	15,700	No	No
P_Deep	C6392	B1YT83	56	58	Copper	µg/kg	9,790	284,160	No	22,000	No	No
P_Deep	C6392	B1YT83	56	58	Ethylene glycol	µg/kg	610	64,320	No	—	ND	No
P_Deep	C6392	B1YT83	56	58	Fluoride	µg/kg	1,080	2,883,840	No	2,810	No	No
P_Deep	C6392	B1YT83	56	58	Hexavalent Chromium	µg/kg	15,300	192	Yes	18,500	No	No
P_Deep	C6392	B1YT83	56	58	Iron	µg/kg	13,500,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6392	B1YT83	56	58	Lead	µg/kg	4,030	3,000,060	No	10,200	No	No
P_Deep	C6392	B1YT83	56	58	Lithium	µg/kg	8,070	192,128	No	13,300	No	No
P_Deep	C6392	B1YT83	56	58	Manganese	µg/kg	266,000	500,736	No	512,000	No	No
P_Deep	C6392	B1YT83	56	58	Nickel	µg/kg	12,600	130,400	No	19,100	No	No
P_Deep	C6392	B1YT83	56	58	Nitrate	µg/kg	7,710	—	ND	52,000	No	No
P_Deep	C6392	B1YT83	56	58	Phosphorus	µg/kg	413,000	—	ND	—	ND	No
P_Deep	C6392	B1YT83	56	58	Strontium	µg/kg	23,000	6,758,400	No	—	ND	No
P_Deep	C6392	B1YT83	56	58	Sulfate	µg/kg	45,000	28	Yes	237,000	No	No
P_Deep	C6392	B1YT83	56	58	Vanadium	µg/kg	31,500	1,600,320	No	85,100	No	No
P_Deep	C6392	B1YT83	56	58	Zinc	µg/kg	29,400	5,971,200	No	67,800	No	No
P_Deep	C6394	B1VJ57A	36	38	Arsenic	µg/kg	11,200	2,920	Yes	20,000	No	No
P_Deep	C6394	B1VJ57A	36	38	Cadmium	µg/kg	1,690	690	Yes	563	Yes	Yes
P_Deep	C6394	B1VJ57A	36	38	Fluoride	µg/kg	7,410	2,883,840	No	2,810	Yes	No
P_Deep	C6394	B1VJ57A	36	38	Silver	µg/kg	933	13,600	No	167	Yes	No
P_Deep	C6394	B1VJ57A	36	38	Thallium	µg/kg	20,800	712	Yes	185	Yes	Yes
P_Deep	C6394	B1VJ57A	36	38	Vanadium	µg/kg	45,100	1,600,320	No	85,100	No	No
P_Deep	C6394	B1VJ57B	36	38	Aluminum	µg/kg	7,620,000	480,064,000	No	11,800,000	No	No
P_Deep	C6394	B1VJ57B	36	38	Barium	µg/kg	76,100	1,648,000	No	132,000	No	No
P_Deep	C6394	B1VJ57B	36	38	Beryllium	µg/kg	285	63,216	No	1,510	No	No
P_Deep	C6394	B1VJ57B	36	38	Chloride	µg/kg	1,840	—	ND	100,000	No	No
P_Deep	C6394	B1VJ57B	36	38	Chromium	µg/kg	19,900	480,096,000	No	18,500	Yes	No
P_Deep	C6394	B1VJ57B	36	38	Cobalt	µg/kg	8,360	4,339	Yes	15,700	No	No
P_Deep	C6394	B1VJ57B	36	38	Copper	µg/kg	14,600	284,160	No	22,000	No	No
P_Deep	C6394	B1VJ57B	36	38	Hexavalent Chromium	µg/kg	19,900	192	Yes	18,500	Yes	Yes
P_Deep	C6394	B1VJ57B	36	38	Iron	µg/kg	20,100,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6394	B1VJ57B	36	38	Lithium	µg/kg	7,880	192,128	No	13,300	No	No
P_Deep	C6394	B1VJ57B	36	38	Manganese	µg/kg	334,000	500,736	No	512,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 63 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6394	B1VJ57B	36	38	Nitrite	µg/kg	1,860	—	ND	—	ND	No
P_Deep	C6394	B1VJ57B	36	38	Phosphorus	µg/kg	750,000	—	ND	—	ND	No
P_Deep	C6394	B1VJ57B	36	38	Strontium	µg/kg	30,100	6,758,400	No	—	ND	No
P_Deep	C6394	B1VJ57B	36	38	Zinc	µg/kg	40,800	5,971,200	No	67,800	No	No
P_Deep	C6394	B1VJ57C	36	38	Lead	µg/kg	14,100	3,000,060	No	10,200	Yes	No
P_Deep	C6394	B1VJ57C	36	38	Nickel	µg/kg	13,000	130,400	No	19,100	No	No
P_Deep	C6394	B1VJ57C	36	38	Nitrate	µg/kg	25,800	—	ND	52,000	No	No
P_Deep	C6394	B1VJ57C	36	38	Sulfate	µg/kg	15,500	28	Yes	237,000	No	No
P_Deep	C6394	B1VJ63A	168	170	Chromium	µg/kg	32,700	480,096,000	No	18,500	Yes	No
P_Deep	C6394	B1VJ63A	168	170	Hexavalent Chromium	µg/kg	32,700	192	Yes	18,500	Yes	Yes
P_Deep	C6394	B1VJ63A	168	170	Nitrate	µg/kg	10,700	—	ND	52,000	No	No
P_Deep	C6394	B1VJ63B	168	170	Aluminum	µg/kg	6,830,000	480,064,000	No	11,800,000	No	No
P_Deep	C6394	B1VJ63B	168	170	Barium	µg/kg	55,200	1,648,000	No	132,000	No	No
P_Deep	C6394	B1VJ63B	168	170	Beryllium	µg/kg	242	63,216	No	1,510	No	No
P_Deep	C6394	B1VJ63B	168	170	Cadmium	µg/kg	1,200	690	Yes	563	Yes	Yes
P_Deep	C6394	B1VJ63B	168	170	Cobalt	µg/kg	5,580	4,339	Yes	15,700	No	No
P_Deep	C6394	B1VJ63B	168	170	Manganese	µg/kg	240,000	500,736	No	512,000	No	No
P_Deep	C6394	B1VJ63B	168	170	Nickel	µg/kg	22,400	130,400	No	19,100	Yes	No
P_Deep	C6394	B1VJ63B	168	170	Nitrite	µg/kg	347	—	ND	—	ND	No
P_Deep	C6394	B1VJ63B	168	170	Phosphorus	µg/kg	426,000	—	ND	—	ND	No
P_Deep	C6394	B1VJ63C	168	170	Chloride	µg/kg	4,510	—	ND	100,000	No	No
P_Deep	C6394	B1VJ63C	168	170	Copper	µg/kg	13,200	284,160	No	22,000	No	No
P_Deep	C6394	B1VJ63C	168	170	Fluoride	µg/kg	431	2,883,840	No	2,810	No	No
P_Deep	C6394	B1VJ63C	168	170	Iron	µg/kg	14,500,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6394	B1VJ63C	168	170	Lithium	µg/kg	9,540	192,128	No	13,300	No	No
P_Deep	C6394	B1VJ63C	168	170	Strontium	µg/kg	29,600	6,758,400	No	—	ND	No
P_Deep	C6394	B1VJ63C	168	170	Sulfate	µg/kg	116,000	28	Yes	237,000	No	No
P_Deep	C6394	B1VJ63C	168	170	Vanadium	µg/kg	29,400	1,600,320	No	85,100	No	No
P_Deep	C6394	B1VJ63C	168	170	Zinc	µg/kg	72,300	5,971,200	No	67,800	Yes	No
P_Deep	C6400	B1YTH4	132	134.5	Acetone	µg/kg	6.69	28,903	No	—	ND	No
P_Deep	C6400	B1YTH6	132	134.5	Aluminum	µg/kg	5,850,000	480,064,000	No	11,800,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Arsenic	µg/kg	3,060	2,920	Yes	20,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Barium	µg/kg	54,100	1,648,000	No	132,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Beryllium	µg/kg	218	63,216	No	1,510	No	No
P_Deep	C6400	B1YTH6	132	134.5	Bis(2-ethylhexyl) phthalate	µg/kg	673	13,359	No	—	ND	No
P_Deep	C6400	B1YTH6	132	134.5	Cadmium	µg/kg	71.2	690	No	563	No	No
P_Deep	C6400	B1YTH6	132	134.5	Chloride	µg/kg	22,200	—	ND	100,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Chromium	µg/kg	15,000	480,096,000	No	18,500	No	No
P_Deep	C6400	B1YTH6	132	134.5	Cobalt	µg/kg	4,170	4,339	No	15,700	No	No
P_Deep	C6400	B1YTH6	132	134.5	Copper	µg/kg	8,720	284,160	No	22,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Fluoride	µg/kg	994	2,883,840	No	2,810	No	No
P_Deep	C6400	B1YTH6	132	134.5	Hexavalent Chromium	µg/kg	15,000	192	Yes	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 64 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6400	B1YTH6	132	134.5	Iron	µg/kg	13,300,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Lead	µg/kg	5,160	3,000,060	No	10,200	No	No
P_Deep	C6400	B1YTH6	132	134.5	Lithium	µg/kg	8,210	192,128	No	13,300	No	No
P_Deep	C6400	B1YTH6	132	134.5	Manganese	µg/kg	253,000	500,736	No	512,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Nickel	µg/kg	12,300	130,400	No	19,100	No	No
P_Deep	C6400	B1YTH6	132	134.5	Nitrate	µg/kg	20,000	—	ND	52,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Nitrite	µg/kg	3,260	—	ND	—	ND	No
P_Deep	C6400	B1YTH6	132	134.5	Phosphorus	µg/kg	365,000	—	ND	—	ND	No
P_Deep	C6400	B1YTH6	132	134.5	Silver	µg/kg	163	13,600	No	167	No	No
P_Deep	C6400	B1YTH6	132	134.5	Strontium	µg/kg	35,900	6,758,400	No	—	ND	No
P_Deep	C6400	B1YTH6	132	134.5	Sulfate	µg/kg	198,000	28	Yes	237,000	No	No
P_Deep	C6400	B1YTH6	132	134.5	Thallium	µg/kg	83.8	712	No	185	No	No
P_Deep	C6400	B1YTH6	132	134.5	Vanadium	µg/kg	27,300	1,600,320	No	85,100	No	No
P_Deep	C6400	B1YTH6	132	134.5	Zinc	µg/kg	30,300	5,971,200	No	67,800	No	No
P_Deep	C6404	B1YT96	14	17	Acetone	µg/kg	4.46	28,903	No	—	ND	No
P_Deep	C6404	B1YT98	14	17	Aluminum	µg/kg	5,710,000	480,064,000	No	11,800,000	No	No
P_Deep	C6404	B1YT98	14	17	Arsenic	µg/kg	4,380	2,920	Yes	20,000	No	No
P_Deep	C6404	B1YT98	14	17	Barium	µg/kg	65,500	1,648,000	No	132,000	No	No
P_Deep	C6404	B1YT98	14	17	Bis(2-ethylhexyl) phthalate	µg/kg	2,040	13,359	No	—	ND	No
P_Deep	C6404	B1YT98	14	17	Cadmium	µg/kg	103	690	No	563	No	No
P_Deep	C6404	B1YT98	14	17	Chloride	µg/kg	1,460	—	ND	100,000	No	No
P_Deep	C6404	B1YT98	14	17	Chromium	µg/kg	6,710	480,096,000	No	18,500	No	No
P_Deep	C6404	B1YT98	14	17	Cobalt	µg/kg	6,500	4,339	Yes	15,700	No	No
P_Deep	C6404	B1YT98	14	17	Copper	µg/kg	10,800	284,160	No	22,000	No	No
P_Deep	C6404	B1YT98	14	17	Di-n-butylphthalate	µg/kg	645	56,444	No	—	ND	No
P_Deep	C6404	B1YT98	14	17	Fluoride	µg/kg	2,040	2,883,840	No	2,810	No	No
P_Deep	C6404	B1YT98	14	17	Hexavalent Chromium	µg/kg	6,710	192	Yes	18,500	No	No
P_Deep	C6404	B1YT98	14	17	Iron	µg/kg	21,600,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6404	B1YT98	14	17	Lead	µg/kg	8,520	3,000,060	No	10,200	No	No
P_Deep	C6404	B1YT98	14	17	Lithium	µg/kg	6,550	192,128	No	13,300	No	No
P_Deep	C6404	B1YT98	14	17	Manganese	µg/kg	306,000	500,736	No	512,000	No	No
P_Deep	C6404	B1YT98	14	17	Mercury	µg/kg	13.2	2,090	No	13.1	Yes	No
P_Deep	C6404	B1YT98	14	17	Nickel	µg/kg	8,760	130,400	No	19,100	No	No
P_Deep	C6404	B1YT98	14	17	Nitrate	µg/kg	10,400	—	ND	52,000	No	No
P_Deep	C6404	B1YT98	14	17	Nitrite	µg/kg	1,350	—	ND	—	ND	No
P_Deep	C6404	B1YT98	14	17	Phosphorus	µg/kg	870,000	—	ND	—	ND	No
P_Deep	C6404	B1YT98	14	17	Silver	µg/kg	156	13,600	No	167	No	No
P_Deep	C6404	B1YT98	14	17	Strontium	µg/kg	27,600	6,758,400	No	—	ND	No
P_Deep	C6404	B1YT98	14	17	Sulfate	µg/kg	12,700	28	Yes	237,000	No	No
P_Deep	C6404	B1YT98	14	17	Thallium	µg/kg	94.3	712	No	185	No	No
P_Deep	C6404	B1YT98	14	17	Vanadium	µg/kg	57,900	1,600,320	No	85,100	No	No
P_Deep	C6404	B1YT98	14	17	Zinc	µg/kg	39,900	5,971,200	No	67,800	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 65 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6404	B1YT99	19.5	21.5	Acetone	µg/kg	8.4	28,903	No	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Aluminum	µg/kg	4,730,000	480,064,000	No	11,800,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Arsenic	µg/kg	3,380	2,920	Yes	20,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Barium	µg/kg	61,100	1,648,000	No	132,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Cadmium	µg/kg	104	690	No	563	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Chloride	µg/kg	2,350	—	ND	100,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Chromium	µg/kg	5,540	480,096,000	No	18,500	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Cobalt	µg/kg	5,100	4,339	Yes	15,700	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Copper	µg/kg	10,500	284,160	No	22,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Di-n-butylphthalate	µg/kg	769	56,444	No	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Fluoride	µg/kg	1,840	2,883,840	No	2,810	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Hexavalent Chromium	µg/kg	5,540	192	Yes	18,500	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Iron	µg/kg	17,100,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Lead	µg/kg	4,380	3,000,060	No	10,200	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Lithium	µg/kg	5,020	192,128	No	13,300	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Manganese	µg/kg	246,000	500,736	No	512,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Nickel	µg/kg	6,950	130,400	No	19,100	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Nitrate	µg/kg	14,900	—	ND	52,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Nitrite	µg/kg	1,700	—	ND	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Phosphorus	µg/kg	640,000	—	ND	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Strontium	µg/kg	20,800	6,758,400	No	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Sulfate	µg/kg	13,800	28	Yes	237,000	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Thallium	µg/kg	74.5	712	No	185	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Tin	µg/kg	7,090	48,038,400	No	—	ND	No
P_Deep	C6404	B1YTB1	19.5	21.5	Vanadium	µg/kg	50,900	1,600,320	No	85,100	No	No
P_Deep	C6404	B1YTB1	19.5	21.5	Zinc	µg/kg	34,200	5,971,200	No	67,800	No	No
P_Deep	C6404	B1YTB2	31	33	Acetone	µg/kg	6.14	28,903	No	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Aluminum	µg/kg	5,560,000	480,064,000	No	11,800,000	No	No
P_Deep	C6404	B1YTB4	31	33	Arsenic	µg/kg	2,780	2,920	No	20,000	No	No
P_Deep	C6404	B1YTB4	31	33	Barium	µg/kg	65,300	1,648,000	No	132,000	No	No
P_Deep	C6404	B1YTB4	31	33	Bis(2-ethylhexyl) phthalate	µg/kg	2,290	13,359	No	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Cadmium	µg/kg	69.4	690	No	563	No	No
P_Deep	C6404	B1YTB4	31	33	Chloride	µg/kg	1,090	—	ND	100,000	No	No
P_Deep	C6404	B1YTB4	31	33	Chromium	µg/kg	10,200	480,096,000	No	18,500	No	No
P_Deep	C6404	B1YTB4	31	33	Cobalt	µg/kg	7,000	4,339	Yes	15,700	No	No
P_Deep	C6404	B1YTB4	31	33	Copper	µg/kg	12,200	284,160	No	22,000	No	No
P_Deep	C6404	B1YTB4	31	33	Di-n-butylphthalate	µg/kg	770	56,444	No	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Fluoride	µg/kg	1,940	2,883,840	No	2,810	No	No
P_Deep	C6404	B1YTB4	31	33	Hexavalent Chromium	µg/kg	10,200	192	Yes	18,500	No	No
P_Deep	C6404	B1YTB4	31	33	Iron	µg/kg	19,600,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6404	B1YTB4	31	33	Lead	µg/kg	4,770	3,000,060	No	10,200	No	No
P_Deep	C6404	B1YTB4	31	33	Lithium	µg/kg	6,700	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 66 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6404	B1YTB4	31	33	Manganese	µg/kg	303,000	500,736	No	512,000	No	No
P_Deep	C6404	B1YTB4	31	33	Nickel	µg/kg	10,500	130,400	No	19,100	No	No
P_Deep	C6404	B1YTB4	31	33	Nitrate	µg/kg	18,000	—	ND	52,000	No	No
P_Deep	C6404	B1YTB4	31	33	Nitrite	µg/kg	2,690	—	ND	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Phosphorus	µg/kg	735,000	—	ND	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Silver	µg/kg	165	13,600	No	167	No	No
P_Deep	C6404	B1YTB4	31	33	Strontium	µg/kg	24,300	6,758,400	No	—	ND	No
P_Deep	C6404	B1YTB4	31	33	Sulfate	µg/kg	24,000	28	Yes	237,000	No	No
P_Deep	C6404	B1YTB4	31	33	Thallium	µg/kg	94.3	712	No	185	No	No
P_Deep	C6404	B1YTB4	31	33	Vanadium	µg/kg	58,000	1,600,320	No	85,100	No	No
P_Deep	C6404	B1YTB4	31	33	Zinc	µg/kg	36,200	5,971,200	No	67,800	No	No
P_Deep	C6404	B1YTB7	42	44	Aluminum	µg/kg	6,500,000	480,064,000	No	11,800,000	No	No
P_Deep	C6404	B1YTB7	42	44	Arsenic	µg/kg	3,940	2,920	Yes	20,000	No	No
P_Deep	C6404	B1YTB7	42	44	Barium	µg/kg	57,900	1,648,000	No	132,000	No	No
P_Deep	C6404	B1YTB7	42	44	Bis(2-ethylhexyl) phthalate	µg/kg	1,120	13,359	No	—	ND	No
P_Deep	C6404	B1YTB7	42	44	Cadmium	µg/kg	91.5	690	No	563	No	No
P_Deep	C6404	B1YTB7	42	44	Chloride	µg/kg	6,750	—	ND	100,000	No	No
P_Deep	C6404	B1YTB7	42	44	Chromium	µg/kg	6,670	480,096,000	No	18,500	No	No
P_Deep	C6404	B1YTB7	42	44	Cobalt	µg/kg	5,030	4,339	Yes	15,700	No	No
P_Deep	C6404	B1YTB7	42	44	Copper	µg/kg	10,500	284,160	No	22,000	No	No
P_Deep	C6404	B1YTB7	42	44	Fluoride	µg/kg	3,870	2,883,840	No	2,810	Yes	No
P_Deep	C6404	B1YTB7	42	44	Hexavalent Chromium	µg/kg	6,670	192	Yes	18,500	No	No
P_Deep	C6404	B1YTB7	42	44	Iron	µg/kg	21,400,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6404	B1YTB7	42	44	Lead	µg/kg	5,390	3,000,060	No	10,200	No	No
P_Deep	C6404	B1YTB7	42	44	Lithium	µg/kg	5,850	192,128	No	13,300	No	No
P_Deep	C6404	B1YTB7	42	44	Manganese	µg/kg	243,000	500,736	No	512,000	No	No
P_Deep	C6404	B1YTB7	42	44	Nickel	µg/kg	10,300	130,400	No	19,100	No	No
P_Deep	C6404	B1YTB7	42	44	Nitrate	µg/kg	143,000	—	ND	52,000	Yes	No
P_Deep	C6404	B1YTB7	42	44	Nitrite	µg/kg	4,440	—	ND	—	ND	No
P_Deep	C6404	B1YTB7	42	44	Phosphorus	µg/kg	1,140,000	—	ND	—	ND	No
P_Deep	C6404	B1YTB7	42	44	Silver	µg/kg	180	13,600	No	167	Yes	No
P_Deep	C6404	B1YTB7	42	44	Strontium	µg/kg	25,800	6,758,400	No	—	ND	No
P_Deep	C6404	B1YTB7	42	44	Sulfate	µg/kg	54,700	28	Yes	237,000	No	No
P_Deep	C6404	B1YTB7	42	44	Thallium	µg/kg	85.2	712	No	185	No	No
P_Deep	C6404	B1YTB7	42	44	Tin	µg/kg	6,780	48,038,400	No	—	ND	No
P_Deep	C6404	B1YTB7	42	44	Vanadium	µg/kg	51,400	1,600,320	No	85,100	No	No
P_Deep	C6404	B1YTB7	42	44	Zinc	µg/kg	40,300	5,971,200	No	67,800	No	No
P_Deep	C6404	B1YTB8	57	59	1,1-Dichloroethene	µg/kg	0.323	50	No	—	ND	No
P_Deep	C6404	B1YTC0	57	59	Aluminum	µg/kg	4,610,000	480,064,000	No	11,800,000	No	No
P_Deep	C6404	B1YTC0	57	59	Arsenic	µg/kg	2,820	2,920	No	20,000	No	No
P_Deep	C6404	B1YTC0	57	59	Barium	µg/kg	51,700	1,648,000	No	132,000	No	No
P_Deep	C6404	B1YTC0	57	59	Bis(2-ethylhexyl) phthalate	µg/kg	2,940	13,359	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 67 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6404	B1YTC0	57	59	Cadmium	µg/kg	49.2	690	No	563	No	No
P_Deep	C6404	B1YTC0	57	59	Chloride	µg/kg	2,090	—	ND	100,000	No	No
P_Deep	C6404	B1YTC0	57	59	Chromium	µg/kg	15,400	480,096,000	No	18,500	No	No
P_Deep	C6404	B1YTC0	57	59	Cobalt	µg/kg	4,200	4,339	No	15,700	No	No
P_Deep	C6404	B1YTC0	57	59	Copper	µg/kg	9,510	284,160	No	22,000	No	No
P_Deep	C6404	B1YTC0	57	59	Fluoride	µg/kg	731	2,883,840	No	2,810	No	No
P_Deep	C6404	B1YTC0	57	59	Hexavalent Chromium	µg/kg	15,400	192	Yes	18,500	No	No
P_Deep	C6404	B1YTC0	57	59	Iron	µg/kg	14,200,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6404	B1YTC0	57	59	Lead	µg/kg	3,920	3,000,060	No	10,200	No	No
P_Deep	C6404	B1YTC0	57	59	Lithium	µg/kg	7,610	192,128	No	13,300	No	No
P_Deep	C6404	B1YTC0	57	59	Manganese	µg/kg	213,000	500,736	No	512,000	No	No
P_Deep	C6404	B1YTC0	57	59	Nickel	µg/kg	20,500	130,400	No	19,100	Yes	No
P_Deep	C6404	B1YTC0	57	59	Nitrate	µg/kg	7,750	—	ND	52,000	No	No
P_Deep	C6404	B1YTC0	57	59	Nitrite	µg/kg	838	—	ND	—	ND	No
P_Deep	C6404	B1YTC0	57	59	Phosphorus	µg/kg	469,000	—	ND	—	ND	No
P_Deep	C6404	B1YTC0	57	59	Strontium	µg/kg	17,500	6,758,400	No	—	ND	No
P_Deep	C6404	B1YTC0	57	59	Sulfate	µg/kg	18,400	28	Yes	237,000	No	No
P_Deep	C6404	B1YTC0	57	59	Thallium	µg/kg	76.9	712	No	185	No	No
P_Deep	C6404	B1YTC0	57	59	Vanadium	µg/kg	29,600	1,600,320	No	85,100	No	No
P_Deep	C6404	B1YTC0	57	59	Zinc	µg/kg	27,800	5,971,200	No	67,800	No	No
P_Deep	C6406	B1YTD6	18	20	Acetone	µg/kg	4.36	28,903	No	—	ND	No
P_Deep	C6406	B1YTD6	18	20	Carbon disulfide	µg/kg	0.26	5,651	No	—	ND	No
P_Deep	C6406	B1YTD6	18	20	Methylene chloride	µg/kg	0.705	22	No	—	ND	No
P_Deep	C6406	B1YTD8	18	20	Aluminum	µg/kg	6,130,000	480,064,000	No	11,800,000	No	No
P_Deep	C6406	B1YTD8	18	20	Arsenic	µg/kg	1,730	2,920	No	20,000	No	No
P_Deep	C6406	B1YTD8	18	20	Barium	µg/kg	99,100	1,648,000	No	132,000	No	No
P_Deep	C6406	B1YTD8	18	20	Cadmium	µg/kg	80.7	690	No	563	No	No
P_Deep	C6406	B1YTD8	18	20	Chloride	µg/kg	987	—	ND	100,000	No	No
P_Deep	C6406	B1YTD8	18	20	Chromium	µg/kg	10,000	480,096,000	No	18,500	No	No
P_Deep	C6406	B1YTD8	18	20	Cobalt	µg/kg	10,500	4,339	Yes	15,700	No	No
P_Deep	C6406	B1YTD8	18	20	Copper	µg/kg	11,400	284,160	No	22,000	No	No
P_Deep	C6406	B1YTD8	18	20	Fluoride	µg/kg	1,700	2,883,840	No	2,810	No	No
P_Deep	C6406	B1YTD8	18	20	Hexavalent Chromium	µg/kg	10,000	192	Yes	18,500	No	No
P_Deep	C6406	B1YTD8	18	20	Iron	µg/kg	26,100,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6406	B1YTD8	18	20	Lead	µg/kg	3,680	3,000,060	No	10,200	No	No
P_Deep	C6406	B1YTD8	18	20	Lithium	µg/kg	4,670	192,128	No	13,300	No	No
P_Deep	C6406	B1YTD8	18	20	Manganese	µg/kg	412,000	500,736	No	512,000	No	No
P_Deep	C6406	B1YTD8	18	20	Nickel	µg/kg	9,000	130,400	No	19,100	No	No
P_Deep	C6406	B1YTD8	18	20	Nitrate	µg/kg	4,730	—	ND	52,000	No	No
P_Deep	C6406	B1YTD8	18	20	Nitrite	µg/kg	862	—	ND	—	ND	No
P_Deep	C6406	B1YTD8	18	20	Phosphorus	µg/kg	770,000	—	ND	—	ND	No
P_Deep	C6406	B1YTD8	18	20	Strontium	µg/kg	26,200	6,758,400	No	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 68 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6406	B1YTD8	18	20	Sulfate	µg/kg	17,200	28	Yes	237,000	No	No
P_Deep	C6406	B1YTD8	18	20	Thallium	µg/kg	91.8	712	No	185	No	No
P_Deep	C6406	B1YTD8	18	20	Tin	µg/kg	13,900	48,038,400	No	—	ND	No
P_Deep	C6406	B1YTD8	18	20	Vanadium	µg/kg	95,100	1,600,320	No	85,100	Yes	No
P_Deep	C6406	B1YTD8	18	20	Zinc	µg/kg	39,800	5,971,200	No	67,800	No	No
P_Deep	C6406	B1YTD9	26	28	Acetone	µg/kg	2.95	28,903	No	—	ND	No
P_Deep	C6406	B1YTD9	26	28	Methylene chloride	µg/kg	0.203	22	No	—	ND	No
P_Deep	C6406	B1YTF1	26	28	Aluminum	µg/kg	5,130,000	480,064,000	No	11,800,000	No	No
P_Deep	C6406	B1YTF1	26	28	Arsenic	µg/kg	3,980	2,920	Yes	20,000	No	No
P_Deep	C6406	B1YTF1	26	28	Barium	µg/kg	58,700	1,648,000	No	132,000	No	No
P_Deep	C6406	B1YTF1	26	28	Cadmium	µg/kg	62.5	690	No	563	No	No
P_Deep	C6406	B1YTF1	26	28	Chloride	µg/kg	875	—	ND	100,000	No	No
P_Deep	C6406	B1YTF1	26	28	Chromium	µg/kg	13,600	480,096,000	No	18,500	No	No
P_Deep	C6406	B1YTF1	26	28	Cobalt	µg/kg	7,600	4,339	Yes	15,700	No	No
P_Deep	C6406	B1YTF1	26	28	Copper	µg/kg	9,510	284,160	No	22,000	No	No
P_Deep	C6406	B1YTF1	26	28	Fluoride	µg/kg	1,240	2,883,840	No	2,810	No	No
P_Deep	C6406	B1YTF1	26	28	Hexavalent Chromium	µg/kg	13,600	192	Yes	18,500	No	No
P_Deep	C6406	B1YTF1	26	28	Iron	µg/kg	15,600,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6406	B1YTF1	26	28	Lead	µg/kg	3,090	3,000,060	No	10,200	No	No
P_Deep	C6406	B1YTF1	26	28	Lithium	µg/kg	6,110	192,128	No	13,300	No	No
P_Deep	C6406	B1YTF1	26	28	Manganese	µg/kg	255,000	500,736	No	512,000	No	No
P_Deep	C6406	B1YTF1	26	28	Nickel	µg/kg	13,300	130,400	No	19,100	No	No
P_Deep	C6406	B1YTF1	26	28	Nitrate	µg/kg	4,880	—	ND	52,000	No	No
P_Deep	C6406	B1YTF1	26	28	Nitrite	µg/kg	2,140	—	ND	—	ND	No
P_Deep	C6406	B1YTF1	26	28	Phosphorus	µg/kg	593,000	—	ND	—	ND	No
P_Deep	C6406	B1YTF1	26	28	Strontium	µg/kg	26,900	6,758,400	No	—	ND	No
P_Deep	C6406	B1YTF1	26	28	Sulfate	µg/kg	13,800	28	Yes	237,000	No	No
P_Deep	C6406	B1YTF1	26	28	Thallium	µg/kg	70.7	712	No	185	No	No
P_Deep	C6406	B1YTF1	26	28	Tin	µg/kg	8,940	48,038,400	No	—	ND	No
P_Deep	C6406	B1YTF1	26	28	Vanadium	µg/kg	47,300	1,600,320	No	85,100	No	No
P_Deep	C6406	B1YTF1	26	28	Zinc	µg/kg	29,400	5,971,200	No	67,800	No	No
P_Deep	C6406	B1YTF2	54.5	56.5	Acetone	µg/kg	5.43	28,903	No	—	ND	No
P_Deep	C6406	B1YTF4	54.5	56.5	Aluminum	µg/kg	6,120,000	480,064,000	No	11,800,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Arsenic	µg/kg	2,400	2,920	No	20,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Barium	µg/kg	67,800	1,648,000	No	132,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Beryllium	µg/kg	199	63,216	No	1,510	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Bis(2-ethylhexyl) phthalate	µg/kg	1,210	13,359	No	—	ND	No
P_Deep	C6406	B1YTF4	54.5	56.5	Cadmium	µg/kg	63.3	690	No	563	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Chloride	µg/kg	1,260	—	ND	100,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Chromium	µg/kg	18,200	480,096,000	No	18,500	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Cobalt	µg/kg	6,230	4,339	Yes	15,700	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Copper	µg/kg	7,870	284,160	No	22,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 69 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Deep	C6406	B1YTF4	54.5	56.5	Fluoride	µg/kg	956	2,883,840	No	2,810	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Hexavalent Chromium	µg/kg	18,200	192	Yes	18,500	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Iron	µg/kg	13,400,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Lead	µg/kg	3,940	3,000,060	No	10,200	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Lithium	µg/kg	9,770	192,128	No	13,300	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Manganese	µg/kg	296,000	500,736	No	512,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Nickel	µg/kg	11,600	130,400	No	19,100	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Nitrate	µg/kg	4,600	—	ND	52,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Nitrite	µg/kg	2,750	—	ND	—	ND	No
P_Deep	C6406	B1YTF4	54.5	56.5	Phosphorus	µg/kg	368,000	—	ND	—	ND	No
P_Deep	C6406	B1YTF4	54.5	56.5	Strontium	µg/kg	26,700	6,758,400	No	—	ND	No
P_Deep	C6406	B1YTF4	54.5	56.5	Sulfate	µg/kg	37,200	28	Yes	237,000	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Thallium	µg/kg	77.9	712	No	185	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Vanadium	µg/kg	33,300	1,600,320	No	85,100	No	No
P_Deep	C6406	B1YTF4	54.5	56.5	Zinc	µg/kg	28,700	5,971,200	No	67,800	No	No
P_Deep	C6406	B1YTF5	59	61	Acetone	µg/kg	4.86	28,903	No	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Aluminum	µg/kg	6,990,000	480,064,000	No	11,800,000	No	No
P_Deep	C6406	B1YTF7	59	61	Arsenic	µg/kg	3,180	2,920	Yes	20,000	No	No
P_Deep	C6406	B1YTF7	59	61	Barium	µg/kg	53,400	1,648,000	No	132,000	No	No
P_Deep	C6406	B1YTF7	59	61	Beryllium	µg/kg	234	63,216	No	1,510	No	No
P_Deep	C6406	B1YTF7	59	61	Bis(2-ethylhexyl) phthalate	µg/kg	1,080	13,359	No	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Cadmium	µg/kg	47.4	690	No	563	No	No
P_Deep	C6406	B1YTF7	59	61	Chloride	µg/kg	796	—	ND	100,000	No	No
P_Deep	C6406	B1YTF7	59	61	Chromium	µg/kg	15,900	480,096,000	No	18,500	No	No
P_Deep	C6406	B1YTF7	59	61	Cobalt	µg/kg	6,140	4,339	Yes	15,700	No	No
P_Deep	C6406	B1YTF7	59	61	Copper	µg/kg	12,400	284,160	No	22,000	No	No
P_Deep	C6406	B1YTF7	59	61	Fluoride	µg/kg	839	2,883,840	No	2,810	No	No
P_Deep	C6406	B1YTF7	59	61	Hexavalent Chromium	µg/kg	15,900	192	Yes	18,500	No	No
P_Deep	C6406	B1YTF7	59	61	Iron	µg/kg	14,400,000	5,644,800	Yes	32,600,000	No	No
P_Deep	C6406	B1YTF7	59	61	Lead	µg/kg	4,630	3,000,060	No	10,200	No	No
P_Deep	C6406	B1YTF7	59	61	Lithium	µg/kg	10,700	192,128	No	13,300	No	No
P_Deep	C6406	B1YTF7	59	61	Manganese	µg/kg	246,000	500,736	No	512,000	No	No
P_Deep	C6406	B1YTF7	59	61	Nickel	µg/kg	19,300	130,400	No	19,100	Yes	No
P_Deep	C6406	B1YTF7	59	61	Nitrate	µg/kg	3,060	—	ND	52,000	No	No
P_Deep	C6406	B1YTF7	59	61	Nitrite	µg/kg	627	—	ND	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Phosphorus	µg/kg	457,000	—	ND	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Strontium	µg/kg	28,900	6,758,400	No	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Sulfate	µg/kg	23,400	28	Yes	237,000	No	No
P_Deep	C6406	B1YTF7	59	61	Thallium	µg/kg	83.9	712	No	185	No	No
P_Deep	C6406	B1YTF7	59	61	Tin	µg/kg	6,670	48,038,400	No	—	ND	No
P_Deep	C6406	B1YTF7	59	61	Vanadium	µg/kg	30,200	1,600,320	No	85,100	No	No
P_Deep	C6406	B1YTF7	59	61	Zinc	µg/kg	29,900	5,971,200	No	67,800	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 70 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6392	B1YT69	14	16	Acetone	µg/kg	9.39	28,903	No	—	ND	No
P_Shallow	C6392	B1YT69	14	16	Toluene	µg/kg	0.294	4,654	No	—	ND	No
P_Shallow	C6392	B1YT71	14	16	Aluminum	µg/kg	7,800,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6392	B1YT71	14	16	Antimony	µg/kg	184	5,424	No	130	Yes	No
P_Shallow	C6392	B1YT71	14	16	Arsenic	µg/kg	5,620	2,920	Yes	20,000	No	No
P_Shallow	C6392	B1YT71	14	16	Barium	µg/kg	77,100	1,648,000	No	132,000	No	No
P_Shallow	C6392	B1YT71	14	16	Cadmium	µg/kg	125	690	No	563	No	No
P_Shallow	C6392	B1YT71	14	16	Chloride	µg/kg	1,340	—	ND	100,000	No	No
P_Shallow	C6392	B1YT71	14	16	Chromium	µg/kg	8,230	480,096,000	No	18,500	No	No
P_Shallow	C6392	B1YT71	14	16	Cobalt	µg/kg	8,960	4,339	Yes	15,700	No	No
P_Shallow	C6392	B1YT71	14	16	Copper	µg/kg	12,500	284,160	No	22,000	No	No
P_Shallow	C6392	B1YT71	14	16	Fluoride	µg/kg	4,760	2,883,840	No	2,810	Yes	No
P_Shallow	C6392	B1YT71	14	16	Hexavalent Chromium	µg/kg	8,230	192	Yes	18,500	No	No
P_Shallow	C6392	B1YT71	14	16	Iron	µg/kg	25,100,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6392	B1YT71	14	16	Lead	µg/kg	7,740	3,000,060	No	10,200	No	No
P_Shallow	C6392	B1YT71	14	16	Lithium	µg/kg	8,300	192,128	No	13,300	No	No
P_Shallow	C6392	B1YT71	14	16	Manganese	µg/kg	369,000	500,736	No	512,000	No	No
P_Shallow	C6392	B1YT71	14	16	Nickel	µg/kg	12,300	130,400	No	19,100	No	No
P_Shallow	C6392	B1YT71	14	16	Nitrate	µg/kg	13,600	—	ND	52,000	No	No
P_Shallow	C6392	B1YT71	14	16	Phosphorus	µg/kg	984,000	—	ND	—	ND	No
P_Shallow	C6392	B1YT71	14	16	Strontium	µg/kg	32,300	6,758,400	No	—	ND	No
P_Shallow	C6392	B1YT71	14	16	Sulfate	µg/kg	17,300	28	Yes	237,000	No	No
P_Shallow	C6392	B1YT71	14	16	Thallium	µg/kg	94.1	712	No	185	No	No
P_Shallow	C6392	B1YT71	14	16	Vanadium	µg/kg	60,200	1,600,320	No	85,100	No	No
P_Shallow	C6392	B1YT71	14	16	Zinc	µg/kg	48,600	5,971,200	No	67,800	No	No
P_Shallow	C6400	B1YTF8	10	12	Acetone	µg/kg	12.6	28,903	No	—	ND	No
P_Shallow	C6400	B1YTF9	5	7	Acetone	µg/kg	6.99	28,903	No	—	ND	No
P_Shallow	C6400	B1YTH1	5	7	Aluminum	µg/kg	5,850,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Arsenic	µg/kg	3,980	2,920	Yes	20,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Barium	µg/kg	66,100	1,648,000	No	132,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Beryllium	µg/kg	191	63,216	No	1,510	No	No
P_Shallow	C6400	B1YTH1	5	7	beta-BHC	µg/kg	26	2.3	Yes	—	ND	Yes
P_Shallow	C6400	B1YTH1	5	7	Cadmium	µg/kg	112	690	No	563	No	No
P_Shallow	C6400	B1YTH1	5	7	Chloride	µg/kg	1,430	—	ND	100,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Chromium	µg/kg	5,480	480,096,000	No	18,500	No	No
P_Shallow	C6400	B1YTH1	5	7	Cobalt	µg/kg	7,660	4,339	Yes	15,700	No	No
P_Shallow	C6400	B1YTH1	5	7	Copper	µg/kg	12,400	284,160	No	22,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Fluoride	µg/kg	1,910	2,883,840	No	2,810	No	No
P_Shallow	C6400	B1YTH1	5	7	Hexavalent Chromium	µg/kg	5,480	192	Yes	18,500	No	No
P_Shallow	C6400	B1YTH1	5	7	Iron	µg/kg	21,000,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Lead	µg/kg	5,790	3,000,060	No	10,200	No	No
P_Shallow	C6400	B1YTH1	5	7	Lithium	µg/kg	6,300	192,128	No	13,300	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 71 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6400	B1YTH1	5	7	Manganese	µg/kg	298,000	500,736	No	512,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Mercury	µg/kg	19.2	2,090	No	13.1	Yes	No
P_Shallow	C6400	B1YTH1	5	7	Nickel	µg/kg	8,580	130,400	No	19,100	No	No
P_Shallow	C6400	B1YTH1	5	7	Nitrate	µg/kg	8,080	—	ND	52,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Nitrite	µg/kg	5,160	—	ND	—	ND	No
P_Shallow	C6400	B1YTH1	5	7	Phosphorus	µg/kg	879,000	—	ND	—	ND	No
P_Shallow	C6400	B1YTH1	5	7	Silver	µg/kg	101	13,600	No	167	No	No
P_Shallow	C6400	B1YTH1	5	7	Strontium	µg/kg	26,600	6,758,400	No	—	ND	No
P_Shallow	C6400	B1YTH1	5	7	Sulfate	µg/kg	9,570	28	Yes	237,000	No	No
P_Shallow	C6400	B1YTH1	5	7	Thallium	µg/kg	82.7	712	No	185	No	No
P_Shallow	C6400	B1YTH1	5	7	Total petroleum hydrocarbons - diesel range	µg/kg	75,700	2,000,000	No	—	ND	No
P_Shallow	C6400	B1YTH1	5	7	Vanadium	µg/kg	58,300	1,600,320	No	85,100	No	No
P_Shallow	C6400	B1YTH1	5	7	Zinc	µg/kg	39,500	5,971,200	No	67,800	No	No
P_Shallow	C6400	B1YTH3	10	12	Aluminum	µg/kg	5,830,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Aroclor-1260	µg/kg	25.2	7,198	No	—	ND	No
P_Shallow	C6400	B1YTH3	10	12	Arsenic	µg/kg	3,830	2,920	Yes	20,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Barium	µg/kg	85,400	1,648,000	No	132,000	No	No
P_Shallow	C6400	B1YTH3	10	12	beta-BHC	µg/kg	23	2.3	Yes	—	ND	Yes
P_Shallow	C6400	B1YTH3	10	12	Cadmium	µg/kg	145	690	No	563	No	No
P_Shallow	C6400	B1YTH3	10	12	Chloride	µg/kg	1,160	—	ND	100,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Chromium	µg/kg	4,470	480,096,000	No	18,500	No	No
P_Shallow	C6400	B1YTH3	10	12	Cobalt	µg/kg	8,170	4,339	Yes	15,700	No	No
P_Shallow	C6400	B1YTH3	10	12	Copper	µg/kg	11,900	284,160	No	22,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Fluoride	µg/kg	1,970	2,883,840	No	2,810	No	No
P_Shallow	C6400	B1YTH3	10	12	Hexavalent Chromium	µg/kg	4,470	192	Yes	18,500	No	No
P_Shallow	C6400	B1YTH3	10	12	Iron	µg/kg	20,000,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Lead	µg/kg	5,620	3,000,060	No	10,200	No	No
P_Shallow	C6400	B1YTH3	10	12	Lithium	µg/kg	5,630	192,128	No	13,300	No	No
P_Shallow	C6400	B1YTH3	10	12	Manganese	µg/kg	346,000	500,736	No	512,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Nickel	µg/kg	9,110	130,400	No	19,100	No	No
P_Shallow	C6400	B1YTH3	10	12	Nitrate	µg/kg	5,720	—	ND	52,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Nitrite	µg/kg	4,370	—	ND	—	ND	No
P_Shallow	C6400	B1YTH3	10	12	Phosphorus	µg/kg	797,000	—	ND	—	ND	No
P_Shallow	C6400	B1YTH3	10	12	Silver	µg/kg	100	13,600	No	167	No	No
P_Shallow	C6400	B1YTH3	10	12	Strontium	µg/kg	27,200	6,758,400	No	—	ND	No
P_Shallow	C6400	B1YTH3	10	12	Sulfate	µg/kg	10,100	28	Yes	237,000	No	No
P_Shallow	C6400	B1YTH3	10	12	Thallium	µg/kg	77.5	712	No	185	No	No
P_Shallow	C6400	B1YTH3	10	12	Total petroleum hydrocarbons - diesel range	µg/kg	73,200	2,000,000	No	—	ND	No
P_Shallow	C6400	B1YTH3	10	12	Vanadium	µg/kg	58,400	1,600,320	No	85,100	No	No
P_Shallow	C6400	B1YTH3	10	12	Zinc	µg/kg	305,000	5,971,200	No	67,800	Yes	No
P_Shallow	C6402	B20XV5	6	8	Aluminum	µg/kg	7,600,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6402	B20XV5	6	8	Antimony	µg/kg	174	5,424	No	130	Yes	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 72 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6402	B20XV5	6	8	Arsenic	µg/kg	4,800	2,920	Yes	20,000	No	No
P_Shallow	C6402	B20XV5	6	8	Barium	µg/kg	82,900	1,648,000	No	132,000	No	No
P_Shallow	C6402	B20XV5	6	8	Beryllium	µg/kg	315	63,216	No	1,510	No	No
P_Shallow	C6402	B20XV5	6	8	beta-BHC	µg/kg	21	2.3	Yes	—	ND	Yes
P_Shallow	C6402	B20XV5	6	8	Cadmium	µg/kg	128	690	No	563	No	No
P_Shallow	C6402	B20XV5	6	8	Chromium	µg/kg	8,700	480,096,000	No	18,500	No	No
P_Shallow	C6402	B20XV5	6	8	Cobalt	µg/kg	8,330	4,339	Yes	15,700	No	No
P_Shallow	C6402	B20XV5	6	8	Copper	µg/kg	12,900	284,160	No	22,000	No	No
P_Shallow	C6402	B20XV5	6	8	Hexavalent Chromium	µg/kg	8,700	192	Yes	18,500	No	No
P_Shallow	C6402	B20XV5	6	8	Iron	µg/kg	24,900,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6402	B20XV5	6	8	Lead	µg/kg	7,280	3,000,060	No	10,200	No	No
P_Shallow	C6402	B20XV5	6	8	Lithium	µg/kg	9,420	192,128	No	13,300	No	No
P_Shallow	C6402	B20XV5	6	8	Manganese	µg/kg	385,000	500,736	No	512,000	No	No
P_Shallow	C6402	B20XV5	6	8	Nickel	µg/kg	6,710	130,400	No	19,100	No	No
P_Shallow	C6402	B20XV5	6	8	Phosphorus	µg/kg	979,000	—	ND	—	ND	No
P_Shallow	C6402	B20XV5	6	8	Silver	µg/kg	207	13,600	No	167	Yes	No
P_Shallow	C6402	B20XV5	6	8	Strontium	µg/kg	30,300	6,758,400	No	—	ND	No
P_Shallow	C6402	B20XV5	6	8	Thallium	µg/kg	95.9	712	No	185	No	No
P_Shallow	C6402	B20XV5	6	8	Total petroleum hydrocarbons - diesel range	µg/kg	64,600	2,000,000	No	—	ND	No
P_Shallow	C6402	B20XV5	6	8	Total petroleum hydrocarbons - gasoline range	µg/kg	100	100,000	No	—	ND	No
P_Shallow	C6402	B20XV5	6	8	Vanadium	µg/kg	78,000	1,600,320	No	85,100	No	No
P_Shallow	C6402	B20XV5	6	8	Zinc	µg/kg	43,900	5,971,200	No	67,800	No	No
P_Shallow	C6402	B20XV9	10	12	Aluminum	µg/kg	7,260,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6402	B20XV9	10	12	Aroclor-1260	µg/kg	26.8	7,198	No	—	ND	No
P_Shallow	C6402	B20XV9	10	12	Arsenic	µg/kg	4,410	2,920	Yes	20,000	No	No
P_Shallow	C6402	B20XV9	10	12	Barium	µg/kg	75,100	1,648,000	No	132,000	No	No
P_Shallow	C6402	B20XV9	10	12	Beryllium	µg/kg	295	63,216	No	1,510	No	No
P_Shallow	C6402	B20XV9	10	12	Bis(2-ethylhexyl) phthalate	µg/kg	804	13,359	No	—	ND	No
P_Shallow	C6402	B20XV9	10	12	Cadmium	µg/kg	106	690	No	563	No	No
P_Shallow	C6402	B20XV9	10	12	Chloride	µg/kg	708	—	ND	100,000	No	No
P_Shallow	C6402	B20XV9	10	12	Chromium	µg/kg	9,080	480,096,000	No	18,500	No	No
P_Shallow	C6402	B20XV9	10	12	Cobalt	µg/kg	9,890	4,339	Yes	15,700	No	No
P_Shallow	C6402	B20XV9	10	12	Copper	µg/kg	13,200	284,160	No	22,000	No	No
P_Shallow	C6402	B20XV9	10	12	Fluoride	µg/kg	1,890	2,883,840	No	2,810	No	No
P_Shallow	C6402	B20XV9	10	12	Hexavalent Chromium	µg/kg	9,080	192	Yes	18,500	No	No
P_Shallow	C6402	B20XV9	10	12	Iron	µg/kg	24,200,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6402	B20XV9	10	12	Lead	µg/kg	6,870	3,000,060	No	10,200	No	No
P_Shallow	C6402	B20XV9	10	12	Lithium	µg/kg	8,470	192,128	No	13,300	No	No
P_Shallow	C6402	B20XV9	10	12	Manganese	µg/kg	358,000	500,736	No	512,000	No	No
P_Shallow	C6402	B20XV9	10	12	Nickel	µg/kg	7,160	130,400	No	19,100	No	No
P_Shallow	C6402	B20XV9	10	12	Nitrate	µg/kg	9,010	—	ND	52,000	No	No
P_Shallow	C6402	B20XV9	10	12	Nitrite	µg/kg	3,690	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 73 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6402	B20XV9	10	12	Phosphorus	µg/kg	1,010,000	—	ND	—	ND	No
P_Shallow	C6402	B20XV9	10	12	Silver	µg/kg	208	13,600	No	167	Yes	No
P_Shallow	C6402	B20XV9	10	12	Strontium	µg/kg	29,500	6,758,400	No	—	ND	No
P_Shallow	C6402	B20XV9	10	12	Sulfate	µg/kg	8,700	28	Yes	237,000	No	No
P_Shallow	C6402	B20XV9	10	12	Thallium	µg/kg	92.2	712	No	185	No	No
P_Shallow	C6402	B20XV9	10	12	Total petroleum hydrocarbons - diesel range	µg/kg	91,100	2,000,000	No	—	ND	No
P_Shallow	C6402	B20XV9	10	12	Vanadium	µg/kg	60,600	1,600,320	No	85,100	No	No
P_Shallow	C6402	B20XV9	10	12	Zinc	µg/kg	44,300	5,971,200	No	67,800	No	No
P_Shallow	C6402	B20XW1	10	12	Acetone	µg/kg	4.2	28,903	No	—	ND	No
P_Shallow	C6402	B20XW3	14	16	Aluminum	µg/kg	6,720,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6402	B20XW3	14	16	Arsenic	µg/kg	5,160	2,920	Yes	20,000	No	No
P_Shallow	C6402	B20XW3	14	16	Barium	µg/kg	68,200	1,648,000	No	132,000	No	No
P_Shallow	C6402	B20XW3	14	16	Beryllium	µg/kg	237	63,216	No	1,510	No	No
P_Shallow	C6402	B20XW3	14	16	Cadmium	µg/kg	105	690	No	563	No	No
P_Shallow	C6402	B20XW3	14	16	Chloride	µg/kg	1,740	—	ND	100,000	No	No
P_Shallow	C6402	B20XW3	14	16	Chromium	µg/kg	9,660	480,096,000	No	18,500	No	No
P_Shallow	C6402	B20XW3	14	16	Cobalt	µg/kg	8,320	4,339	Yes	15,700	No	No
P_Shallow	C6402	B20XW3	14	16	Copper	µg/kg	12,600	284,160	No	22,000	No	No
P_Shallow	C6402	B20XW3	14	16	Fluoride	µg/kg	2,390	2,883,840	No	2,810	No	No
P_Shallow	C6402	B20XW3	14	16	Hexavalent Chromium	µg/kg	9,660	192	Yes	18,500	No	No
P_Shallow	C6402	B20XW3	14	16	Iron	µg/kg	22,300,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6402	B20XW3	14	16	Lead	µg/kg	7,790	3,000,060	No	10,200	No	No
P_Shallow	C6402	B20XW3	14	16	Lithium	µg/kg	8,450	192,128	No	13,300	No	No
P_Shallow	C6402	B20XW3	14	16	Manganese	µg/kg	305,000	500,736	No	512,000	No	No
P_Shallow	C6402	B20XW3	14	16	Nickel	µg/kg	7,390	130,400	No	19,100	No	No
P_Shallow	C6402	B20XW3	14	16	Nitrate	µg/kg	17,500	—	ND	52,000	No	No
P_Shallow	C6402	B20XW3	14	16	Nitrite	µg/kg	5,760	—	ND	—	ND	No
P_Shallow	C6402	B20XW3	14	16	Phosphorus	µg/kg	955,000	—	ND	—	ND	No
P_Shallow	C6402	B20XW3	14	16	Silver	µg/kg	223	13,600	No	167	Yes	No
P_Shallow	C6402	B20XW3	14	16	Strontium	µg/kg	28,000	6,758,400	No	—	ND	No
P_Shallow	C6402	B20XW3	14	16	Sulfate	µg/kg	18,600	28	Yes	237,000	No	No
P_Shallow	C6402	B20XW3	14	16	Thallium	µg/kg	114	712	No	185	No	No
P_Shallow	C6402	B20XW3	14	16	Total petroleum hydrocarbons - diesel range	µg/kg	135,000	2,000,000	No	—	ND	No
P_Shallow	C6402	B20XW3	14	16	Vanadium	µg/kg	71,400	1,600,320	No	85,100	No	No
P_Shallow	C6402	B20XW3	14	16	Zinc	µg/kg	42,500	5,971,200	No	67,800	No	No
P_Shallow	C6402	B20XW5	14	16	Acetone	µg/kg	4.18	28,903	No	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Aluminum	µg/kg	5,810,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6404	B1YT92	6	8	Arsenic	µg/kg	4,310	2,920	Yes	20,000	No	No
P_Shallow	C6404	B1YT92	6	8	Barium	µg/kg	68,800	1,648,000	No	132,000	No	No
P_Shallow	C6404	B1YT92	6	8	Bis(2-ethylhexyl) phthalate	µg/kg	2,300	13,359	No	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Cadmium	µg/kg	88.5	690	No	563	No	No
P_Shallow	C6404	B1YT92	6	8	Chloride	µg/kg	3,710	—	ND	100,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 74 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6404	B1YT92	6	8	Chromium	µg/kg	6,800	480,096,000	No	18,500	No	No
P_Shallow	C6404	B1YT92	6	8	Cobalt	µg/kg	6,370	4,339	Yes	15,700	No	No
P_Shallow	C6404	B1YT92	6	8	Copper	µg/kg	11,300	284,160	No	22,000	No	No
P_Shallow	C6404	B1YT92	6	8	Di-n-butylphthalate	µg/kg	863	56,444	No	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Fluoride	µg/kg	2,390	2,883,840	No	2,810	No	No
P_Shallow	C6404	B1YT92	6	8	Hexavalent Chromium	µg/kg	6,800	192	Yes	18,500	No	No
P_Shallow	C6404	B1YT92	6	8	Iron	µg/kg	20,700,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6404	B1YT92	6	8	Lead	µg/kg	6,150	3,000,060	No	10,200	No	No
P_Shallow	C6404	B1YT92	6	8	Lithium	µg/kg	6,740	192,128	No	13,300	No	No
P_Shallow	C6404	B1YT92	6	8	Manganese	µg/kg	291,000	500,736	No	512,000	No	No
P_Shallow	C6404	B1YT92	6	8	Nickel	µg/kg	9,510	130,400	No	19,100	No	No
P_Shallow	C6404	B1YT92	6	8	Nitrate	µg/kg	3,700	—	ND	52,000	No	No
P_Shallow	C6404	B1YT92	6	8	Nitrite	µg/kg	1,670	—	ND	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Phosphorus	µg/kg	791,000	—	ND	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Silver	µg/kg	160	13,600	No	167	No	No
P_Shallow	C6404	B1YT92	6	8	Strontium	µg/kg	26,300	6,758,400	No	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Sulfate	µg/kg	6,690	28	Yes	237,000	No	No
P_Shallow	C6404	B1YT92	6	8	Thallium	µg/kg	92.4	712	No	185	No	No
P_Shallow	C6404	B1YT92	6	8	Tin	µg/kg	9,200	48,038,400	No	—	ND	No
P_Shallow	C6404	B1YT92	6	8	Vanadium	µg/kg	56,700	1,600,320	No	85,100	No	No
P_Shallow	C6404	B1YT92	6	8	Zinc	µg/kg	39,900	5,971,200	No	67,800	No	No
P_Shallow	C6406	B1YTC7	5	7	Acetone	µg/kg	12.3	28,903	No	—	ND	No
P_Shallow	C6406	B1YTC7	5	7	Methylene chloride	µg/kg	1.14	22	No	—	ND	No
P_Shallow	C6406	B1YTC9	5	7	Aluminum	µg/kg	7,180,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Arsenic	µg/kg	4,190	2,920	Yes	20,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Barium	µg/kg	86,100	1,648,000	No	132,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Beryllium	µg/kg	248	63,216	No	1,510	No	No
P_Shallow	C6406	B1YTC9	5	7	Cadmium	µg/kg	99.1	690	No	563	No	No
P_Shallow	C6406	B1YTC9	5	7	Chloride	µg/kg	1,520	—	ND	100,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Chromium	µg/kg	9,260	480,096,000	No	18,500	No	No
P_Shallow	C6406	B1YTC9	5	7	Cobalt	µg/kg	8,600	4,339	Yes	15,700	No	No
P_Shallow	C6406	B1YTC9	5	7	Copper	µg/kg	12,400	284,160	No	22,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Fluoride	µg/kg	1,340	2,883,840	No	2,810	No	No
P_Shallow	C6406	B1YTC9	5	7	Hexavalent Chromium	µg/kg	9,260	192	Yes	18,500	No	No
P_Shallow	C6406	B1YTC9	5	7	Iron	µg/kg	22,400,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Lead	µg/kg	8,060	3,000,060	No	10,200	No	No
P_Shallow	C6406	B1YTC9	5	7	Lithium	µg/kg	8,460	192,128	No	13,300	No	No
P_Shallow	C6406	B1YTC9	5	7	Manganese	µg/kg	349,000	500,736	No	512,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Nickel	µg/kg	9,650	130,400	No	19,100	No	No
P_Shallow	C6406	B1YTC9	5	7	Nitrate	µg/kg	9,840	—	ND	52,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Nitrite	µg/kg	4,800	—	ND	—	ND	No
P_Shallow	C6406	B1YTC9	5	7	Phosphorus	µg/kg	908,000	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 75 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6406	B1YTC9	5	7	Strontium	µg/kg	39,100	6,758,400	No	—	ND	No
P_Shallow	C6406	B1YTC9	5	7	Sulfate	µg/kg	41,700	28	Yes	237,000	No	No
P_Shallow	C6406	B1YTC9	5	7	Thallium	µg/kg	144	712	No	185	No	No
P_Shallow	C6406	B1YTC9	5	7	Tin	µg/kg	7,750	48,038,400	No	—	ND	No
P_Shallow	C6406	B1YTC9	5	7	Vanadium	µg/kg	60,800	1,600,320	No	85,100	No	No
P_Shallow	C6406	B1YTC9	5	7	Zinc	µg/kg	40,900	5,971,200	No	67,800	No	No
P_Shallow	C6406	B1YTD0	10	12	Acetone	µg/kg	13.1	28,903	No	—	ND	No
P_Shallow	C6406	B1YTD0	10	12	Methylene chloride	µg/kg	0.795	22	No	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Aluminum	µg/kg	6,870,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Antimony	µg/kg	367	5,424	No	130	Yes	No
P_Shallow	C6406	B1YTD2	10	12	Arsenic	µg/kg	5,900	2,920	Yes	20,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Barium	µg/kg	82,500	1,648,000	No	132,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Beryllium	µg/kg	275	63,216	No	1,510	No	No
P_Shallow	C6406	B1YTD2	10	12	Cadmium	µg/kg	108	690	No	563	No	No
P_Shallow	C6406	B1YTD2	10	12	Chloride	µg/kg	636	—	ND	100,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Chromium	µg/kg	10,600	480,096,000	No	18,500	No	No
P_Shallow	C6406	B1YTD2	10	12	Cobalt	µg/kg	9,240	4,339	Yes	15,700	No	No
P_Shallow	C6406	B1YTD2	10	12	Copper	µg/kg	12,600	284,160	No	22,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Fluoride	µg/kg	1,690	2,883,840	No	2,810	No	No
P_Shallow	C6406	B1YTD2	10	12	Hexavalent Chromium	µg/kg	10,600	192	Yes	18,500	No	No
P_Shallow	C6406	B1YTD2	10	12	Iron	µg/kg	24,300,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Lead	µg/kg	7,620	3,000,060	No	10,200	No	No
P_Shallow	C6406	B1YTD2	10	12	Lithium	µg/kg	8,230	192,128	No	13,300	No	No
P_Shallow	C6406	B1YTD2	10	12	Manganese	µg/kg	385,000	500,736	No	512,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Nickel	µg/kg	12,500	130,400	No	19,100	No	No
P_Shallow	C6406	B1YTD2	10	12	Nitrate	µg/kg	4,890	—	ND	52,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Nitrite	µg/kg	2,600	—	ND	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Phosphorus	µg/kg	879,000	—	ND	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Silver	µg/kg	149	13,600	No	167	No	No
P_Shallow	C6406	B1YTD2	10	12	Strontium	µg/kg	37,300	6,758,400	No	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Sulfate	µg/kg	22,000	28	Yes	237,000	No	No
P_Shallow	C6406	B1YTD2	10	12	Thallium	µg/kg	115	712	No	185	No	No
P_Shallow	C6406	B1YTD2	10	12	Tin	µg/kg	7,970	48,038,400	No	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Total petroleum hydrocarbons - diesel range	µg/kg	89,600	2,000,000	No	—	ND	No
P_Shallow	C6406	B1YTD2	10	12	Vanadium	µg/kg	62,400	1,600,320	No	85,100	No	No
P_Shallow	C6406	B1YTD2	10	12	Zinc	µg/kg	42,700	5,971,200	No	67,800	No	No
P_Shallow	C6406	B1YTD3	14	16	Methylene chloride	µg/kg	2.61	22	No	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Aluminum	µg/kg	5,650,000	480,064,000	No	11,800,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Arsenic	µg/kg	1,790	2,920	No	20,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Barium	µg/kg	79,900	1,648,000	No	132,000	No	No
P_Shallow	C6406	B1YTD5	14	16	beta-BHC	µg/kg	23	2.3	Yes	—	ND	Yes
P_Shallow	C6406	B1YTD5	14	16	Cadmium	µg/kg	76.8	690	No	563	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 76 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
P_Shallow	C6406	B1YTD5	14	16	Chloride	µg/kg	520	—	ND	100,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Chromium	µg/kg	21,800	480,096,000	No	18,500	Yes	No
P_Shallow	C6406	B1YTD5	14	16	Cobalt	µg/kg	9,900	4,339	Yes	15,700	No	No
P_Shallow	C6406	B1YTD5	14	16	Copper	µg/kg	12,800	284,160	No	22,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Fluoride	µg/kg	1,410	2,883,840	No	2,810	No	No
P_Shallow	C6406	B1YTD5	14	16	Hexavalent Chromium	µg/kg	21,800	192	Yes	18,500	Yes	Yes
P_Shallow	C6406	B1YTD5	14	16	Iron	µg/kg	30,500,000	5,644,800	Yes	32,600,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Lead	µg/kg	2,930	3,000,060	No	10,200	No	No
P_Shallow	C6406	B1YTD5	14	16	Lithium	µg/kg	4,190	192,128	No	13,300	No	No
P_Shallow	C6406	B1YTD5	14	16	Manganese	µg/kg	356,000	500,736	No	512,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Nickel	µg/kg	13,900	130,400	No	19,100	No	No
P_Shallow	C6406	B1YTD5	14	16	Nitrate	µg/kg	5,490	—	ND	52,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Nitrite	µg/kg	3,420	—	ND	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Phosphorus	µg/kg	993,000	—	ND	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Strontium	µg/kg	27,400	6,758,400	No	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Sulfate	µg/kg	12,600	28	Yes	237,000	No	No
P_Shallow	C6406	B1YTD5	14	16	Thallium	µg/kg	74.6	712	No	185	No	No
P_Shallow	C6406	B1YTD5	14	16	Tin	µg/kg	14,400	48,038,400	No	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Total petroleum hydrocarbons - diesel range	µg/kg	72,600	2,000,000	No	—	ND	No
P_Shallow	C6406	B1YTD5	14	16	Vanadium	µg/kg	110,000	1,600,320	No	85,100	Yes	No
P_Shallow	C6406	B1YTD5	14	16	Zinc	µg/kg	44,000	5,971,200	No	67,800	No	No
R_Deep	C7668	B23TM6	27	29	Aluminum	µg/kg	7,190,000	480,064,000	No	11,800,000	No	No
R_Deep	C7668	B23TM6	27	29	Antimony	µg/kg	303	5,424	No	130	Yes	No
R_Deep	C7668	B23TM6	27	29	Arsenic	µg/kg	4,480	2,920	Yes	20,000	No	No
R_Deep	C7668	B23TM6	27	29	Barium	µg/kg	73,200	1,648,000	No	132,000	No	No
R_Deep	C7668	B23TM6	27	29	Beryllium	µg/kg	159	63,216	No	1,510	No	No
R_Deep	C7668	B23TM6	27	29	Butylbenzylphthalate	µg/kg	107	12,845	No	—	ND	No
R_Deep	C7668	B23TM6	27	29	Cadmium	µg/kg	3,080	690	Yes	563	Yes	Yes
R_Deep	C7668	B23TM6	27	29	Chloride	µg/kg	1,290	—	ND	100,000	No	No
R_Deep	C7668	B23TM6	27	29	Chromium	µg/kg	10,900	480,096,000	No	18,500	No	No
R_Deep	C7668	B23TM6	27	29	Cobalt	µg/kg	9,720	4,339	Yes	15,700	No	No
R_Deep	C7668	B23TM6	27	29	Copper	µg/kg	11,300	284,160	No	22,000	No	No
R_Deep	C7668	B23TM6	27	29	Di-n-octylphthalate	µg/kg	317	266,240,641	No	—	ND	No
R_Deep	C7668	B23TM6	27	29	Fluoride	µg/kg	2,490	2,883,840	No	2,810	No	No
R_Deep	C7668	B23TM6	27	29	Hexavalent Chromium	µg/kg	10,900	192	Yes	18,500	No	No
R_Deep	C7668	B23TM6	27	29	Iron	µg/kg	21,900,000	5,644,800	Yes	32,600,000	No	No
R_Deep	C7668	B23TM6	27	29	Lead	µg/kg	4,460	3,000,060	No	10,200	No	No
R_Deep	C7668	B23TM6	27	29	Lithium	µg/kg	7,010	192,128	No	13,300	No	No
R_Deep	C7668	B23TM6	27	29	Manganese	µg/kg	323,000	500,736	No	512,000	No	No
R_Deep	C7668	B23TM6	27	29	Nickel	µg/kg	14,600	130,400	No	19,100	No	No
R_Deep	C7668	B23TM6	27	29	Nitrate	µg/kg	39,100	—	ND	52,000	No	No
R_Deep	C7668	B23TM6	27	29	Nitrite	µg/kg	1,400	—	ND	—	ND	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 77 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Deep	C7668	B23TM6	27	29	Phosphorus	µg/kg	812,000	—	ND	—	ND	No
R_Deep	C7668	B23TM6	27	29	Selenium	µg/kg	524	5,200	No	780	No	No
R_Deep	C7668	B23TM6	27	29	Silver	µg/kg	58.4	13,600	No	167	No	No
R_Deep	C7668	B23TM6	27	29	Strontium	µg/kg	28,400	6,758,400	No	—	ND	No
R_Deep	C7668	B23TM6	27	29	Sulfate	µg/kg	17,900	28	Yes	237,000	No	No
R_Deep	C7668	B23TM6	27	29	Thallium	µg/kg	667	712	No	185	Yes	No
R_Deep	C7668	B23TM6	27	29	Vanadium	µg/kg	53,200	1,600,320	No	85,100	No	No
R_Deep	C7668	B23TM6	27	29	Zinc	µg/kg	39,200	5,971,200	No	67,800	No	No
R_Deep	C7668	B23TM8	27	29	Acetone	µg/kg	3.86	28,903	No	—	ND	No
R_Deep	C7668	B23TM8	27	29	Toluene	µg/kg	0.256	4,654	No	—	ND	No
R_Deep	C7668	B25WM2	39	41	Aluminum	µg/kg	6,660,000	480,064,000	No	11,800,000	No	No
R_Deep	C7668	B25WM2	39	41	Antimony	µg/kg	114	5,424	No	130	No	No
R_Deep	C7668	B25WM2	39	41	Arsenic	µg/kg	2,950	2,920	Yes	20,000	No	No
R_Deep	C7668	B25WM2	39	41	Barium	µg/kg	71,900	1,648,000	No	132,000	No	No
R_Deep	C7668	B25WM2	39	41	Beryllium	µg/kg	172	63,216	No	1,510	No	No
R_Deep	C7668	B25WM2	39	41	Butylbenzylphthalate	µg/kg	114	12,845	No	—	ND	No
R_Deep	C7668	B25WM2	39	41	Cadmium	µg/kg	1,510	690	Yes	563	Yes	Yes
R_Deep	C7668	B25WM2	39	41	Chloride	µg/kg	2,660	—	ND	100,000	No	No
R_Deep	C7668	B25WM2	39	41	Chromium	µg/kg	13,900	480,096,000	No	18,500	No	No
R_Deep	C7668	B25WM2	39	41	Cobalt	µg/kg	6,060	4,339	Yes	15,700	No	No
R_Deep	C7668	B25WM2	39	41	Copper	µg/kg	8,590	284,160	No	22,000	No	No
R_Deep	C7668	B25WM2	39	41	Fluoride	µg/kg	1,850	2,883,840	No	2,810	No	No
R_Deep	C7668	B25WM2	39	41	Hexavalent Chromium	µg/kg	13,900	192	Yes	18,500	No	No
R_Deep	C7668	B25WM2	39	41	Iron	µg/kg	12,500,000	5,644,800	Yes	32,600,000	No	No
R_Deep	C7668	B25WM2	39	41	Lead	µg/kg	3,430	3,000,060	No	10,200	No	No
R_Deep	C7668	B25WM2	39	41	Lithium	µg/kg	8,750	192,128	No	13,300	No	No
R_Deep	C7668	B25WM2	39	41	Manganese	µg/kg	261,000	500,736	No	512,000	No	No
R_Deep	C7668	B25WM2	39	41	Nickel	µg/kg	13,000	130,400	No	19,100	No	No
R_Deep	C7668	B25WM2	39	41	Nitrate	µg/kg	8,600	—	ND	52,000	No	No
R_Deep	C7668	B25WM2	39	41	Nitrite	µg/kg	2,360	—	ND	—	ND	No
R_Deep	C7668	B25WM2	39	41	Phosphorus	µg/kg	422,000	—	ND	—	ND	No
R_Deep	C7668	B25WM2	39	41	Selenium	µg/kg	317	5,200	No	780	No	No
R_Deep	C7668	B25WM2	39	41	Silver	µg/kg	39.4	13,600	No	167	No	No
R_Deep	C7668	B25WM2	39	41	Strontium	µg/kg	33,800	6,758,400	No	—	ND	No
R_Deep	C7668	B25WM2	39	41	Sulfate	µg/kg	19,900	28	Yes	237,000	No	No
R_Deep	C7668	B25WM2	39	41	Thallium	µg/kg	83.1	712	No	185	No	No
R_Deep	C7668	B25WM2	39	41	Vanadium	µg/kg	23,100	1,600,320	No	85,100	No	No
R_Deep	C7668	B25WM2	39	41	Zinc	µg/kg	30,000	5,971,200	No	67,800	No	No
R_Deep	C7668	B25WM4	39	41	Acetone	µg/kg	5	28,903	No	—	ND	No
R_Deep	C7668	B25WM4	39	41	Methylene chloride	µg/kg	1.5	22	No	—	ND	No
R_Deep	C7668	B25WM4	39	41	Trichloromonofluoromethane	µg/kg	11	28,204	No	—	ND	No
R_Deep	C7668	B25WM5	80	82	Aluminum	µg/kg	6,120,000	480,064,000	No	11,800,000	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 78 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Deep	C7668	B25WM5	80	82	Antimony	µg/kg	144	5,424	No	130	Yes	No
R_Deep	C7668	B25WM5	80	82	Arsenic	µg/kg	2,990	2,920	Yes	20,000	No	No
R_Deep	C7668	B25WM5	80	82	Barium	µg/kg	51,200	1,648,000	No	132,000	No	No
R_Deep	C7668	B25WM5	80	82	Beryllium	µg/kg	166	63,216	No	1,510	No	No
R_Deep	C7668	B25WM5	80	82	Butylbenzylphthalate	µg/kg	108	12,845	No	—	ND	No
R_Deep	C7668	B25WM5	80	82	Cadmium	µg/kg	1,160	690	Yes	563	Yes	Yes
R_Deep	C7668	B25WM5	80	82	Chloride	µg/kg	2,480	—	ND	100,000	No	No
R_Deep	C7668	B25WM5	80	82	Chromium	µg/kg	13,200	480,096,000	No	18,500	No	No
R_Deep	C7668	B25WM5	80	82	Cobalt	µg/kg	5,880	4,339	Yes	15,700	No	No
R_Deep	C7668	B25WM5	80	82	Copper	µg/kg	8,430	284,160	No	22,000	No	No
R_Deep	C7668	B25WM5	80	82	Fluoride	µg/kg	597	2,883,840	No	2,810	No	No
R_Deep	C7668	B25WM5	80	82	Hexavalent Chromium	µg/kg	13,200	192	Yes	18,500	No	No
R_Deep	C7668	B25WM5	80	82	Iron	µg/kg	12,700,000	5,644,800	Yes	32,600,000	No	No
R_Deep	C7668	B25WM5	80	82	Lead	µg/kg	3,410	3,000,060	No	10,200	No	No
R_Deep	C7668	B25WM5	80	82	Lithium	µg/kg	8,140	192,128	No	13,300	No	No
R_Deep	C7668	B25WM5	80	82	Manganese	µg/kg	247,000	500,736	No	512,000	No	No
R_Deep	C7668	B25WM5	80	82	Nickel	µg/kg	12,100	130,400	No	19,100	No	No
R_Deep	C7668	B25WM5	80	82	Nitrate	µg/kg	4,050	—	ND	52,000	No	No
R_Deep	C7668	B25WM5	80	82	Nitrite	µg/kg	846	—	ND	—	ND	No
R_Deep	C7668	B25WM5	80	82	Phosphorus	µg/kg	514,000	—	ND	—	ND	No
R_Deep	C7668	B25WM5	80	82	Selenium	µg/kg	434	5,200	No	780	No	No
R_Deep	C7668	B25WM5	80	82	Silver	µg/kg	36.2	13,600	No	167	No	No
R_Deep	C7668	B25WM5	80	82	Strontium	µg/kg	30,100	6,758,400	No	—	ND	No
R_Deep	C7668	B25WM5	80	82	Sulfate	µg/kg	13,900	28	Yes	237,000	No	No
R_Deep	C7668	B25WM5	80	82	Thallium	µg/kg	80.6	712	No	185	No	No
R_Deep	C7668	B25WM5	80	82	Vanadium	µg/kg	20,200	1,600,320	No	85,100	No	No
R_Deep	C7668	B25WM5	80	82	Zinc	µg/kg	27,100	5,971,200	No	67,800	No	No
R_Deep	C7668	B25WM7	80	82	Acetone	µg/kg	1.2	28,903	No	—	ND	No
R_Deep	C7668	B25WM7	80	82	Methylene chloride	µg/kg	1.1	22	No	—	ND	No
R_Deep	C7668	B25WM7	80	82	Trichloromonofluoromethane	µg/kg	2.3	28,204	No	—	ND	No
R_Deep	C7668	B25WM8	132	134	Aluminum	µg/kg	7,380,000	480,064,000	No	11,800,000	No	No
R_Deep	C7668	B25WM8	132	134	Antimony	µg/kg	149	5,424	No	130	Yes	No
R_Deep	C7668	B25WM8	132	134	Arsenic	µg/kg	2,530	2,920	No	20,000	No	No
R_Deep	C7668	B25WM8	132	134	Barium	µg/kg	62,800	1,648,000	No	132,000	No	No
R_Deep	C7668	B25WM8	132	134	Beryllium	µg/kg	164	63,216	No	1,510	No	No
R_Deep	C7668	B25WM8	132	134	Butylbenzylphthalate	µg/kg	105	12,845	No	—	ND	No
R_Deep	C7668	B25WM8	132	134	Cadmium	µg/kg	2,120	690	Yes	563	Yes	Yes
R_Deep	C7668	B25WM8	132	134	Chloride	µg/kg	1,110	—	ND	100,000	No	No
R_Deep	C7668	B25WM8	132	134	Chromium	µg/kg	14,700	480,096,000	No	18,500	No	No
R_Deep	C7668	B25WM8	132	134	Cobalt	µg/kg	6,870	4,339	Yes	15,700	No	No
R_Deep	C7668	B25WM8	132	134	Copper	µg/kg	9,910	284,160	No	22,000	No	No
R_Deep	C7668	B25WM8	132	134	Fluoride	µg/kg	957	2,883,840	No	2,810	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 79 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Deep	C7668	B25WM8	132	134	Hexavalent Chromium	µg/kg	14,700	192	Yes	18,500	No	No
R_Deep	C7668	B25WM8	132	134	Iron	µg/kg	15,800,000	5,644,800	Yes	32,600,000	No	No
R_Deep	C7668	B25WM8	132	134	Lead	µg/kg	3,190	3,000,060	No	10,200	No	No
R_Deep	C7668	B25WM8	132	134	Lithium	µg/kg	8,000	192,128	No	13,300	No	No
R_Deep	C7668	B25WM8	132	134	Manganese	µg/kg	300,000	500,736	No	512,000	No	No
R_Deep	C7668	B25WM8	132	134	Nickel	µg/kg	14,400	130,400	No	19,100	No	No
R_Deep	C7668	B25WM8	132	134	Nitrate	µg/kg	1,470	—	ND	52,000	No	No
R_Deep	C7668	B25WM8	132	134	Nitrite	µg/kg	1,150	—	ND	—	ND	No
R_Deep	C7668	B25WM8	132	134	Phosphorus	µg/kg	570,000	—	ND	—	ND	No
R_Deep	C7668	B25WM8	132	134	Selenium	µg/kg	452	5,200	No	780	No	No
R_Deep	C7668	B25WM8	132	134	Silver	µg/kg	46.4	13,600	No	167	No	No
R_Deep	C7668	B25WM8	132	134	Strontium	µg/kg	33,700	6,758,400	No	—	ND	No
R_Deep	C7668	B25WM8	132	134	Sulfate	µg/kg	17,100	28	Yes	237,000	No	No
R_Deep	C7668	B25WM8	132	134	Thallium	µg/kg	88	712	No	185	No	No
R_Deep	C7668	B25WM8	132	134	Vanadium	µg/kg	32,900	1,600,320	No	85,100	No	No
R_Deep	C7668	B25WM8	132	134	Zinc	µg/kg	30,500	5,971,200	No	67,800	No	No
R_Deep	C7668	B25WN0	132	134	Acetone	µg/kg	10	28,903	No	—	ND	No
R_Deep	C7668	B25WN0	132	134	Methylene chloride	µg/kg	6.9	22	No	—	ND	No
R_Deep	C7668	B25WN0	132	134	Trichloromonofluoromethane	µg/kg	11	28,204	No	—	ND	No
R_Deep	C7668	B27131	14	18	Aluminum	µg/kg	7,110,000	480,064,000	No	11,800,000	No	No
R_Deep	C7668	B27131	14	18	Antimony	µg/kg	114	5,424	No	130	No	No
R_Deep	C7668	B27131	14	18	Arsenic	µg/kg	3,770	2,920	Yes	20,000	No	No
R_Deep	C7668	B27131	14	18	Barium	µg/kg	75,500	1,648,000	No	132,000	No	No
R_Deep	C7668	B27131	14	18	Beryllium	µg/kg	135	63,216	No	1,510	No	No
R_Deep	C7668	B27131	14	18	Cadmium	µg/kg	2,970	690	Yes	563	Yes	Yes
R_Deep	C7668	B27131	14	18	Chloride	µg/kg	573	—	ND	100,000	No	No
R_Deep	C7668	B27131	14	18	Chromium	µg/kg	11,000	480,096,000	No	18,500	No	No
R_Deep	C7668	B27131	14	18	Cobalt	µg/kg	9,350	4,339	Yes	15,700	No	No
R_Deep	C7668	B27131	14	18	Copper	µg/kg	12,200	284,160	No	22,000	No	No
R_Deep	C7668	B27131	14	18	Di-n-octylphthalate	µg/kg	320	266,240,641	No	—	ND	No
R_Deep	C7668	B27131	14	18	Fluoride	µg/kg	1,920	2,883,840	No	2,810	No	No
R_Deep	C7668	B27131	14	18	Hexavalent Chromium	µg/kg	11,000	192	Yes	18,500	No	No
R_Deep	C7668	B27131	14	18	Iron	µg/kg	24,000,000	5,644,800	Yes	32,600,000	No	No
R_Deep	C7668	B27131	14	18	Lead	µg/kg	4,300	3,000,060	No	10,200	No	No
R_Deep	C7668	B27131	14	18	Lithium	µg/kg	7,620	192,128	No	13,300	No	No
R_Deep	C7668	B27131	14	18	Manganese	µg/kg	359,000	500,736	No	512,000	No	No
R_Deep	C7668	B27131	14	18	Nickel	µg/kg	9,190	130,400	No	19,100	No	No
R_Deep	C7668	B27131	14	18	Nitrate	µg/kg	12,200	—	ND	52,000	No	No
R_Deep	C7668	B27131	14	18	Nitrite	µg/kg	4,750	—	ND	—	ND	No
R_Deep	C7668	B27131	14	18	Phosphorus	µg/kg	839,000	—	ND	—	ND	No
R_Deep	C7668	B27131	14	18	Selenium	µg/kg	438	5,200	No	780	No	No
R_Deep	C7668	B27131	14	18	Silver	µg/kg	41.9	13,600	No	167	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 80 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Deep	C7668	B27131	14	18	Strontium	µg/kg	31,500	6,758,400	No	—	ND	No
R_Deep	C7668	B27131	14	18	Sulfate	µg/kg	9,100	28	Yes	237,000	No	No
R_Deep	C7668	B27131	14	18	Thallium	µg/kg	661	712	No	185	Yes	No
R_Deep	C7668	B27131	14	18	Vanadium	µg/kg	60,000	1,600,320	No	85,100	No	No
R_Deep	C7668	B27131	14	18	Zinc	µg/kg	42,300	5,971,200	No	67,800	No	No
R_Shallow	C7668	B23TK2	0	1	Selenium	µg/kg	701	5,200	No	780	No	No
R_Shallow	C7668	B23TK2	0	1	Silver	µg/kg	53	13,600	No	167	No	No
R_Shallow	C7668	B23TK2	0	1	Thallium	µg/kg	1,220	712	Yes	185	Yes	Yes
R_Shallow	C7668	B23TK4	0	1	2-Hexanone	µg/kg	2.52	172	No	—	ND	No
R_Shallow	C7668	B23TK4	0	1	Toluene	µg/kg	0.592	4,654	No	—	ND	No
R_Shallow	C7668	B23TK5	0	1	Aluminum	µg/kg	7,700,000	480,064,000	No	11,800,000	No	No
R_Shallow	C7668	B23TK5	0	1	Antimony	µg/kg	245	5,424	No	130	Yes	No
R_Shallow	C7668	B23TK5	0	1	Arsenic	µg/kg	5,250	2,920	Yes	20,000	No	No
R_Shallow	C7668	B23TK5	0	1	Barium	µg/kg	73,200	1,648,000	No	132,000	No	No
R_Shallow	C7668	B23TK5	0	1	Beryllium	µg/kg	156	63,216	No	1,510	No	No
R_Shallow	C7668	B23TK5	0	1	Butylbenzylphthalate	µg/kg	76.1	12,845	No	—	ND	No
R_Shallow	C7668	B23TK5	0	1	Cadmium	µg/kg	3,020	690	Yes	563	Yes	Yes
R_Shallow	C7668	B23TK5	0	1	Chloride	µg/kg	1,090	—	ND	100,000	No	No
R_Shallow	C7668	B23TK5	0	1	Chromium	µg/kg	9,250	480,096,000	No	18,500	No	No
R_Shallow	C7668	B23TK5	0	1	Cobalt	µg/kg	10,500	4,339	Yes	15,700	No	No
R_Shallow	C7668	B23TK5	0	1	Copper	µg/kg	13,500	284,160	No	22,000	No	No
R_Shallow	C7668	B23TK5	0	1	Fluoride	µg/kg	964	2,883,840	No	2,810	No	No
R_Shallow	C7668	B23TK5	0	1	Hexavalent Chromium	µg/kg	9,250	192	Yes	18,500	No	No
R_Shallow	C7668	B23TK5	0	1	Iron	µg/kg	25,800,000	5,644,800	Yes	32,600,000	No	No
R_Shallow	C7668	B23TK5	0	1	Lead	µg/kg	8,450	3,000,060	No	10,200	No	No
R_Shallow	C7668	B23TK5	0	1	Lithium	µg/kg	8,000	192,128	No	13,300	No	No
R_Shallow	C7668	B23TK5	0	1	Manganese	µg/kg	386,000	500,736	No	512,000	No	No
R_Shallow	C7668	B23TK5	0	1	Mercury	µg/kg	13.5	2,090	No	13.1	Yes	No
R_Shallow	C7668	B23TK5	0	1	Nickel	µg/kg	11,000	130,400	No	19,100	No	No
R_Shallow	C7668	B23TK5	0	1	Nitrate	µg/kg	6,710	—	ND	52,000	No	No
R_Shallow	C7668	B23TK5	0	1	Nitrite	µg/kg	5,310	—	ND	—	ND	No
R_Shallow	C7668	B23TK5	0	1	Phosphorus	µg/kg	953,000	—	ND	—	ND	No
R_Shallow	C7668	B23TK5	0	1	Strontium	µg/kg	31,000	6,758,400	No	—	ND	No
R_Shallow	C7668	B23TK5	0	1	Sulfate	µg/kg	4,140	28	Yes	237,000	No	No
R_Shallow	C7668	B23TK5	0	1	Vanadium	µg/kg	64,200	1,600,320	No	85,100	No	No
R_Shallow	C7668	B23TK5	0	1	Zinc	µg/kg	47,800	5,971,200	No	67,800	No	No
R_Shallow	C7668	B23TK8	5	7	Aluminum	µg/kg	8,390,000	480,064,000	No	11,800,000	No	No
R_Shallow	C7668	B23TK8	5	7	Arsenic	µg/kg	5,830	2,920	Yes	20,000	No	No
R_Shallow	C7668	B23TK8	5	7	Barium	µg/kg	79,200	1,648,000	No	132,000	No	No
R_Shallow	C7668	B23TK8	5	7	Beryllium	µg/kg	175	63,216	No	1,510	No	No
R_Shallow	C7668	B23TK8	5	7	Butylbenzylphthalate	µg/kg	107	12,845	No	—	ND	No
R_Shallow	C7668	B23TK8	5	7	Cadmium	µg/kg	3,470	690	Yes	563	Yes	Yes

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 81 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Shallow	C7668	B23TK8	5	7	Chloride	µg/kg	1,300	—	ND	100,000	No	No
R_Shallow	C7668	B23TK8	5	7	Chromium	µg/kg	11,200	480,096,000	No	18,500	No	No
R_Shallow	C7668	B23TK8	5	7	Cobalt	µg/kg	10,500	4,339	Yes	15,700	No	No
R_Shallow	C7668	B23TK8	5	7	Copper	µg/kg	14,800	284,160	No	22,000	No	No
R_Shallow	C7668	B23TK8	5	7	Di-n-octylphthalate	µg/kg	422	266,240,641	No	—	ND	No
R_Shallow	C7668	B23TK8	5	7	Fluoride	µg/kg	2,690	2,883,840	No	2,810	No	No
R_Shallow	C7668	B23TK8	5	7	Hexavalent Chromium	µg/kg	11,200	192	Yes	18,500	No	No
R_Shallow	C7668	B23TK8	5	7	Iron	µg/kg	25,900,000	5,644,800	Yes	32,600,000	No	No
R_Shallow	C7668	B23TK8	5	7	Lead	µg/kg	6,300	3,000,060	No	10,200	No	No
R_Shallow	C7668	B23TK8	5	7	Lithium	µg/kg	9,050	192,128	No	13,300	No	No
R_Shallow	C7668	B23TK8	5	7	Manganese	µg/kg	409,000	500,736	No	512,000	No	No
R_Shallow	C7668	B23TK8	5	7	Nickel	µg/kg	10,900	130,400	No	19,100	No	No
R_Shallow	C7668	B23TK8	5	7	Nitrate	µg/kg	9,210	—	ND	52,000	No	No
R_Shallow	C7668	B23TK8	5	7	Nitrite	µg/kg	387	—	ND	—	ND	No
R_Shallow	C7668	B23TK8	5	7	Phosphorus	µg/kg	990,000	—	ND	—	ND	No
R_Shallow	C7668	B23TK8	5	7	Selenium	µg/kg	594	5,200	No	780	No	No
R_Shallow	C7668	B23TK8	5	7	Silver	µg/kg	51.9	13,600	No	167	No	No
R_Shallow	C7668	B23TK8	5	7	Strontium	µg/kg	37,300	6,758,400	No	—	ND	No
R_Shallow	C7668	B23TK8	5	7	Sulfate	µg/kg	5,660	28	Yes	237,000	No	No
R_Shallow	C7668	B23TK8	5	7	Thallium	µg/kg	714	712	Yes	185	Yes	Yes
R_Shallow	C7668	B23TK8	5	7	Vanadium	µg/kg	64,100	1,600,320	No	85,100	No	No
R_Shallow	C7668	B23TK8	5	7	Zinc	µg/kg	48,600	5,971,200	No	67,800	No	No
R_Shallow	C7668	B23TL0	5	7	2-Hexanone	µg/kg	2.77	172	No	—	ND	No
R_Shallow	C7668	B23TL0	5	7	Toluene	µg/kg	0.344	4,654	No	—	ND	No
R_Shallow	C7668	B23TL6	10	12	2-Hexanone	µg/kg	2.08	172	No	—	ND	No
R_Shallow	C7668	B23TL6	10	12	Acetone	µg/kg	2.53	28,903	No	—	ND	No
R_Shallow	C7668	B23TL6	10	12	Toluene	µg/kg	0.316	4,654	No	—	ND	No
R_Shallow	C7668	B23TM2	14	16	Acetone	µg/kg	6.4	28,903	No	—	ND	No
R_Shallow	C7668	B23TM2	14	16	Methylene chloride	µg/kg	1.4	22	No	—	ND	No
R_Shallow	C7668	B27130	10	14	Aluminum	µg/kg	6,770,000	480,064,000	No	11,800,000	No	No
R_Shallow	C7668	B27130	10	14	Antimony	µg/kg	161	5,424	No	130	Yes	No
R_Shallow	C7668	B27130	10	14	Arsenic	µg/kg	4,900	2,920	Yes	20,000	No	No
R_Shallow	C7668	B27130	10	14	Barium	µg/kg	66,800	1,648,000	No	132,000	No	No
R_Shallow	C7668	B27130	10	14	Beryllium	µg/kg	166	63,216	No	1,510	No	No
R_Shallow	C7668	B27130	10	14	Cadmium	µg/kg	2,990	690	Yes	563	Yes	Yes
R_Shallow	C7668	B27130	10	14	Chloride	µg/kg	763	—	ND	100,000	No	No
R_Shallow	C7668	B27130	10	14	Chromium	µg/kg	10,000	480,096,000	No	18,500	No	No
R_Shallow	C7668	B27130	10	14	Cobalt	µg/kg	8,370	4,339	Yes	15,700	No	No
R_Shallow	C7668	B27130	10	14	Copper	µg/kg	11,000	284,160	No	22,000	No	No
R_Shallow	C7668	B27130	10	14	Di-n-octylphthalate	µg/kg	572	266,240,641	No	—	ND	No
R_Shallow	C7668	B27130	10	14	Fluoride	µg/kg	3,530	2,883,840	No	2,810	Yes	No
R_Shallow	C7668	B27130	10	14	Hexavalent Chromium	µg/kg	10,000	192	Yes	18,500	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 82 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
R_Shallow	C7668	B27130	10	14	Iron	µg/kg	22,100,000	5,644,800	Yes	32,600,000	No	No
R_Shallow	C7668	B27130	10	14	Lead	µg/kg	4,310	3,000,060	No	10,200	No	No
R_Shallow	C7668	B27130	10	14	Lithium	µg/kg	7,290	192,128	No	13,300	No	No
R_Shallow	C7668	B27130	10	14	Manganese	µg/kg	331,000	500,736	No	512,000	No	No
R_Shallow	C7668	B27130	10	14	Nickel	µg/kg	8,690	130,400	No	19,100	No	No
R_Shallow	C7668	B27130	10	14	Nitrate	µg/kg	39,700	—	ND	52,000	No	No
R_Shallow	C7668	B27130	10	14	Phosphorus	µg/kg	772,000	—	ND	—	ND	No
R_Shallow	C7668	B27130	10	14	Selenium	µg/kg	685	5,200	No	780	No	No
R_Shallow	C7668	B27130	10	14	Silver	µg/kg	69.4	13,600	No	167	No	No
R_Shallow	C7668	B27130	10	14	Strontium	µg/kg	29,900	6,758,400	No	—	ND	No
R_Shallow	C7668	B27130	10	14	Sulfate	µg/kg	7,830	28	Yes	237,000	No	No
R_Shallow	C7668	B27130	10	14	Thallium	µg/kg	703	712	No	185	Yes	No
R_Shallow	C7668	B27130	10	14	Vanadium	µg/kg	55,600	1,600,320	No	85,100	No	No
R_Shallow	C7668	B27130	10	14	Zinc	µg/kg	45,300	5,971,200	No	67,800	No	No
U_Deep	C7676	B26CD0	38	40	Aluminum	µg/kg	7,620,000	480,064,000	No	11,800,000	No	No
U_Deep	C7676	B26CD0	38	40	Arsenic	µg/kg	6,000	2,920	Yes	20,000	No	No
U_Deep	C7676	B26CD0	38	40	Barium	µg/kg	75,700	1,648,000	No	132,000	No	No
U_Deep	C7676	B26CD0	38	40	Beryllium	µg/kg	221	63,216	No	1,510	No	No
U_Deep	C7676	B26CD0	38	40	Cadmium	µg/kg	190	690	No	563	No	No
U_Deep	C7676	B26CD0	38	40	Chloride	µg/kg	825	—	ND	100,000	No	No
U_Deep	C7676	B26CD0	38	40	Chromium	µg/kg	9,860	480,096,000	No	18,500	No	No
U_Deep	C7676	B26CD0	38	40	Cobalt	µg/kg	7,070	4,339	Yes	15,700	No	No
U_Deep	C7676	B26CD0	38	40	Copper	µg/kg	12,500	284,160	No	22,000	No	No
U_Deep	C7676	B26CD0	38	40	Fluoride	µg/kg	1,320	2,883,840	No	2,810	No	No
U_Deep	C7676	B26CD0	38	40	Hexavalent Chromium	µg/kg	9,860	192	Yes	18,500	No	No
U_Deep	C7676	B26CD0	38	40	Iron	µg/kg	18,500,000	5,644,800	Yes	32,600,000	No	No
U_Deep	C7676	B26CD0	38	40	Lead	µg/kg	10,900	3,000,060	No	10,200	Yes	No
U_Deep	C7676	B26CD0	38	40	Lithium	µg/kg	8,740	192,128	No	13,300	No	No
U_Deep	C7676	B26CD0	38	40	Manganese	µg/kg	307,000	500,736	No	512,000	No	No
U_Deep	C7676	B26CD0	38	40	Nickel	µg/kg	12,300	130,400	No	19,100	No	No
U_Deep	C7676	B26CD0	38	40	Nitrate	µg/kg	11,800	—	ND	52,000	No	No
U_Deep	C7676	B26CD0	38	40	Phosphorus	µg/kg	738,000	—	ND	—	ND	No
U_Deep	C7676	B26CD0	38	40	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
U_Deep	C7676	B26CD0	38	40	Strontium	µg/kg	36,100	6,758,400	No	—	ND	No
U_Deep	C7676	B26CD0	38	40	Sulfate	µg/kg	11,100	28	Yes	237,000	No	No
U_Deep	C7676	B26CD0	38	40	Thallium	µg/kg	165	712	No	185	No	No
U_Deep	C7676	B26CD0	38	40	Vanadium	µg/kg	42,000	1,600,320	No	85,100	No	No
U_Deep	C7676	B26CD0	38	40	Zinc	µg/kg	37,100	5,971,200	No	67,800	No	No
U_Deep	C7676	B26CD2	128	130	Aluminum	µg/kg	5,770,000	480,064,000	No	11,800,000	No	No
U_Deep	C7676	B26CD2	128	130	Arsenic	µg/kg	4,000	2,920	Yes	20,000	No	No
U_Deep	C7676	B26CD2	128	130	Barium	µg/kg	55,200	1,648,000	No	132,000	No	No
U_Deep	C7676	B26CD2	128	130	Beryllium	µg/kg	174	63,216	No	1,510	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 83 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
U_Deep	C7676	B26CD2	128	130	Cadmium	µg/kg	125	690	No	563	No	No
U_Deep	C7676	B26CD2	128	130	Chloride	µg/kg	13,700	—	ND	100,000	No	No
U_Deep	C7676	B26CD2	128	130	Chromium	µg/kg	14,700	480,096,000	No	18,500	No	No
U_Deep	C7676	B26CD2	128	130	Cobalt	µg/kg	4,060	4,339	No	15,700	No	No
U_Deep	C7676	B26CD2	128	130	Copper	µg/kg	7,510	284,160	No	22,000	No	No
U_Deep	C7676	B26CD2	128	130	Fluoride	µg/kg	433	2,883,840	No	2,810	No	No
U_Deep	C7676	B26CD2	128	130	Hexavalent Chromium	µg/kg	14,700	192	Yes	18,500	No	No
U_Deep	C7676	B26CD2	128	130	Iron	µg/kg	11,800,000	5,644,800	Yes	32,600,000	No	No
U_Deep	C7676	B26CD2	128	130	Lead	µg/kg	8,280	3,000,060	No	10,200	No	No
U_Deep	C7676	B26CD2	128	130	Lithium	µg/kg	8,250	192,128	No	13,300	No	No
U_Deep	C7676	B26CD2	128	130	Manganese	µg/kg	213,000	500,736	No	512,000	No	No
U_Deep	C7676	B26CD2	128	130	Nickel	µg/kg	12,400	130,400	No	19,100	No	No
U_Deep	C7676	B26CD2	128	130	Nitrate	µg/kg	71,600	—	ND	52,000	Yes	No
U_Deep	C7676	B26CD2	128	130	Nitrite	µg/kg	393	—	ND	—	ND	No
U_Deep	C7676	B26CD2	128	130	Phosphorus	µg/kg	354,000	—	ND	—	ND	No
U_Deep	C7676	B26CD2	128	130	Selenium	µg/kg	800	5,200	No	780	Yes	No
U_Deep	C7676	B26CD2	128	130	Strontium	µg/kg	28,100	6,758,400	No	—	ND	No
U_Deep	C7676	B26CD2	128	130	Sulfate	µg/kg	131,000	28	Yes	237,000	No	No
U_Deep	C7676	B26CD2	128	130	Thallium	µg/kg	154	712	No	185	No	No
U_Deep	C7676	B26CD2	128	130	Vanadium	µg/kg	22,800	1,600,320	No	85,100	No	No
U_Deep	C7676	B26CD2	128	130	Zinc	µg/kg	26,000	5,971,200	No	67,800	No	No
U_Deep	C7676	B26CD3	128	130	Toluene	µg/kg	0.564	4,654	No	—	ND	No
U_Deep	C7676	B26CD4	157	159	Aluminum	µg/kg	8,370,000	480,064,000	No	11,800,000	No	No
U_Deep	C7676	B26CD4	157	159	Arsenic	µg/kg	4,000	2,920	Yes	20,000	No	No
U_Deep	C7676	B26CD4	157	159	Barium	µg/kg	68,000	1,648,000	No	132,000	No	No
U_Deep	C7676	B26CD4	157	159	Beryllium	µg/kg	231	63,216	No	1,510	No	No
U_Deep	C7676	B26CD4	157	159	Cadmium	µg/kg	140	690	No	563	No	No
U_Deep	C7676	B26CD4	157	159	Chloride	µg/kg	2,070	—	ND	100,000	No	No
U_Deep	C7676	B26CD4	157	159	Chromium	µg/kg	44,500	480,096,000	No	18,500	Yes	No
U_Deep	C7676	B26CD4	157	159	Cobalt	µg/kg	6,330	4,339	Yes	15,700	No	No
U_Deep	C7676	B26CD4	157	159	Copper	µg/kg	12,000	284,160	No	22,000	No	No
U_Deep	C7676	B26CD4	157	159	Fluoride	µg/kg	594	2,883,840	No	2,810	No	No
U_Deep	C7676	B26CD4	157	159	Hexavalent Chromium	µg/kg	44,500	192	Yes	18,500	Yes	Yes
U_Deep	C7676	B26CD4	157	159	Iron	µg/kg	18,500,000	5,644,800	Yes	32,600,000	No	No
U_Deep	C7676	B26CD4	157	159	Lead	µg/kg	8,110	3,000,060	No	10,200	No	No
U_Deep	C7676	B26CD4	157	159	Lithium	µg/kg	11,600	192,128	No	13,300	No	No
U_Deep	C7676	B26CD4	157	159	Manganese	µg/kg	307,000	500,736	No	512,000	No	No
U_Deep	C7676	B26CD4	157	159	Molybdenum	µg/kg	1,880	32,320	No	470	Yes	No
U_Deep	C7676	B26CD4	157	159	Nickel	µg/kg	29,400	130,400	No	19,100	Yes	No
U_Deep	C7676	B26CD4	157	159	Nitrate	µg/kg	4,490	—	ND	52,000	No	No
U_Deep	C7676	B26CD4	157	159	Phosphorus	µg/kg	571,000	—	ND	—	ND	No
U_Deep	C7676	B26CD4	157	159	Selenium	µg/kg	800	5,200	No	780	Yes	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 84 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
U_Deep	C7676	B26CD4	157	159	Strontium	µg/kg	34,300	6,758,400	No	—	ND	No
U_Deep	C7676	B26CD4	157	159	Sulfate	µg/kg	44,800	28	Yes	237,000	No	No
U_Deep	C7676	B26CD4	157	159	Thallium	µg/kg	127	712	No	185	No	No
U_Deep	C7676	B26CD4	157	159	Vanadium	µg/kg	37,600	1,600,320	No	85,100	No	No
U_Deep	C7676	B26CD4	157	159	Zinc	µg/kg	37,900	5,971,200	No	67,800	No	No
U_Deep	C7676	B26CD5	157	159	2-Butanone	µg/kg	13.8	19,652	No	—	ND	No
U_Deep	C7676	B26CD5	157	159	Acetone	µg/kg	25.7	28,903	No	—	ND	No
U_Deep	C7676	B26CD5	157	159	Styrene	µg/kg	0.346	2,244	No	—	ND	No
U_Deep	C7676	B26CD5	157	159	Toluene	µg/kg	0.561	4,654	No	—	ND	No
U_Deep	C7676	B29613	14	18	Aluminum	µg/kg	5,730,000	480,064,000	No	11,800,000	No	No
U_Deep	C7676	B29613	14	18	Antimony	µg/kg	139	5,424	No	130	Yes	No
U_Deep	C7676	B29613	14	18	Arsenic	µg/kg	20,000	2,920	Yes	20,000	No	No
U_Deep	C7676	B29613	14	18	Barium	µg/kg	55,800	1,648,000	No	132,000	No	No
U_Deep	C7676	B29613	14	18	Beryllium	µg/kg	142	63,216	No	1,510	No	No
U_Deep	C7676	B29613	14	18	Chloride	µg/kg	786	—	ND	100,000	No	No
U_Deep	C7676	B29613	14	18	Chromium	µg/kg	10,000	480,096,000	No	18,500	No	No
U_Deep	C7676	B29613	14	18	Cobalt	µg/kg	7,100	4,339	Yes	15,700	No	No
U_Deep	C7676	B29613	14	18	Copper	µg/kg	10,100	284,160	No	22,000	No	No
U_Deep	C7676	B29613	14	18	Fluoride	µg/kg	1,300	2,883,840	No	2,810	No	No
U_Deep	C7676	B29613	14	18	Hexavalent Chromium	µg/kg	10,000	192	Yes	18,500	No	No
U_Deep	C7676	B29613	14	18	Iron	µg/kg	17,700,000	5,644,800	Yes	32,600,000	No	No
U_Deep	C7676	B29613	14	18	Lead	µg/kg	4,000	3,000,060	No	10,200	No	No
U_Deep	C7676	B29613	14	18	Lithium	µg/kg	6,190	192,128	No	13,300	No	No
U_Deep	C7676	B29613	14	18	Manganese	µg/kg	265,000	500,736	No	512,000	No	No
U_Deep	C7676	B29613	14	18	Nickel	µg/kg	10,700	130,400	No	19,100	No	No
U_Deep	C7676	B29613	14	18	Nitrate	µg/kg	6,980	—	ND	52,000	No	No
U_Deep	C7676	B29613	14	18	Nitrite	µg/kg	2,370	—	ND	—	ND	No
U_Deep	C7676	B29613	14	18	Phosphorus	µg/kg	669,000	—	ND	—	ND	No
U_Deep	C7676	B29613	14	18	Selenium	µg/kg	800	5,200	No	780	Yes	No
U_Deep	C7676	B29613	14	18	Strontium	µg/kg	28,100	6,758,400	No	—	ND	No
U_Deep	C7676	B29613	14	18	Sulfate	µg/kg	6,200	28	Yes	237,000	No	No
U_Deep	C7676	B29613	14	18	Vanadium	µg/kg	43,900	1,600,320	No	85,100	No	No
U_Deep	C7676	B29613	14	18	Zinc	µg/kg	31,700	5,971,200	No	67,800	No	No
U_Shallow	C7676	B26CC1	5	7	Toluene	µg/kg	0.584	4,654	No	—	ND	No
U_Shallow	C7676	B26CC4	10	12	Aluminum	µg/kg	4,960,000	480,064,000	No	11,800,000	No	No
U_Shallow	C7676	B26CC4	10	12	Antimony	µg/kg	151	5,424	No	130	Yes	No
U_Shallow	C7676	B26CC4	10	12	Arsenic	µg/kg	3,000	2,920	Yes	20,000	No	No
U_Shallow	C7676	B26CC4	10	12	Barium	µg/kg	48,100	1,648,000	No	132,000	No	No
U_Shallow	C7676	B26CC4	10	12	Beryllium	µg/kg	126	63,216	No	1,510	No	No
U_Shallow	C7676	B26CC4	10	12	Chloride	µg/kg	1,060	—	ND	100,000	No	No
U_Shallow	C7676	B26CC4	10	12	Chromium	µg/kg	8,510	480,096,000	No	18,500	No	No
U_Shallow	C7676	B26CC4	10	12	Cobalt	µg/kg	5,540	4,339	Yes	15,700	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 85 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
U_Shallow	C7676	B26CC4	10	12	Copper	µg/kg	9,080	284,160	No	22,000	No	No
U_Shallow	C7676	B26CC4	10	12	Fluoride	µg/kg	2,020	2,883,840	No	2,810	No	No
U_Shallow	C7676	B26CC4	10	12	Hexavalent Chromium	µg/kg	8,510	192	Yes	18,500	No	No
U_Shallow	C7676	B26CC4	10	12	Iron	µg/kg	15,500,000	5,644,800	Yes	32,600,000	No	No
U_Shallow	C7676	B26CC4	10	12	Lead	µg/kg	3,000	3,000,060	No	10,200	No	No
U_Shallow	C7676	B26CC4	10	12	Lithium	µg/kg	5,520	192,128	No	13,300	No	No
U_Shallow	C7676	B26CC4	10	12	Manganese	µg/kg	226,000	500,736	No	512,000	No	No
U_Shallow	C7676	B26CC4	10	12	Nickel	µg/kg	6,680	130,400	No	19,100	No	No
U_Shallow	C7676	B26CC4	10	12	Nitrate	µg/kg	6,590	—	ND	52,000	No	No
U_Shallow	C7676	B26CC4	10	12	Nitrite	µg/kg	671	—	ND	—	ND	No
U_Shallow	C7676	B26CC4	10	12	Phosphorus	µg/kg	562,000	—	ND	—	ND	No
U_Shallow	C7676	B26CC4	10	12	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
U_Shallow	C7676	B26CC4	10	12	Strontium	µg/kg	23,000	6,758,400	No	—	ND	No
U_Shallow	C7676	B26CC4	10	12	Sulfate	µg/kg	9,020	28	Yes	237,000	No	No
U_Shallow	C7676	B26CC4	10	12	Vanadium	µg/kg	38,800	1,600,320	No	85,100	No	No
U_Shallow	C7676	B26CC4	10	12	Zinc	µg/kg	28,500	5,971,200	No	67,800	No	No
U_Shallow	C7676	B26CC5	10	12	Acetone	µg/kg	6.18	28,903	No	—	ND	No
U_Shallow	C7676	B26CC5	10	12	Toluene	µg/kg	0.56	4,654	No	—	ND	No
U_Shallow	C7676	B26CC7	14	16	Acetone	µg/kg	5.96	28,903	No	—	ND	No
U_Shallow	C7676	B26CC7	14	16	Benzene	µg/kg	0.328	28.2	No	—	ND	No
U_Shallow	C7676	B26CC7	14	16	Toluene	µg/kg	0.704	4,654	No	—	ND	No
U_Shallow	C7676	B26JK6	0	1	Aluminum	µg/kg	6,910,000	480,064,000	No	11,800,000	No	No
U_Shallow	C7676	B26JK6	0	1	Antimony	µg/kg	229	5,424	No	130	Yes	No
U_Shallow	C7676	B26JK6	0	1	Barium	µg/kg	96,900	1,648,000	No	132,000	No	No
U_Shallow	C7676	B26JK6	0	1	Chromium	µg/kg	7,460	480,096,000	No	18,500	No	No
U_Shallow	C7676	B26JK6	0	1	Cobalt	µg/kg	8,510	4,339	Yes	15,700	No	No
U_Shallow	C7676	B26JK6	0	1	Fluoride	µg/kg	402	2,883,840	No	2,810	No	No
U_Shallow	C7676	B26JK6	0	1	Hexavalent Chromium	µg/kg	7,460	192	Yes	18,500	No	No
U_Shallow	C7676	B26JK6	0	1	Iron	µg/kg	20,900,000	5,644,800	Yes	32,600,000	No	No
U_Shallow	C7676	B26JK6	0	1	Manganese	µg/kg	304,000	500,736	No	512,000	No	No
U_Shallow	C7676	B26JK6	0	1	Molybdenum	µg/kg	2,380	32,320	No	470	Yes	No
U_Shallow	C7676	B26JK6	0	1	Nickel	µg/kg	8,780	130,400	No	19,100	No	No
U_Shallow	C7676	B26JK6	0	1	Nitrate	µg/kg	8,510	—	ND	52,000	No	No
U_Shallow	C7676	B26JK6	0	1	Phosphorus	µg/kg	917,000	—	ND	—	ND	No
U_Shallow	C7676	B26JK6	0	1	Sulfate	µg/kg	4,750	—	ND	237,000	No	No
U_Shallow	C7676	B26JK6	0	1	Vanadium	µg/kg	50,000	1,600,320	No	85,100	No	No
U_Shallow	C7676	B26JK6	0	1	Zinc	µg/kg	40,900	5,971,200	No	67,800	No	No
U_Shallow	C7676	B26JK7	0	1	Arsenic	µg/kg	4,000	2,920	Yes	20,000	No	No
U_Shallow	C7676	B26JK7	0	1	Beryllium	µg/kg	222	63,216	No	1,510	No	No
U_Shallow	C7676	B26JK7	0	1	Chloride	µg/kg	1,510	—	ND	100,000	No	No
U_Shallow	C7676	B26JK7	0	1	Copper	µg/kg	11,500	284,160	No	22,000	No	No
U_Shallow	C7676	B26JK7	0	1	Lead	µg/kg	4,000	3,000,060	No	10,200	No	No

Table H-1. Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results Compared to Soil Concentrations Protective of Groundwater and/or Background Concentration. (sheet 86 of 86)

Site/Decision Unit	Well Name	Sample Number	Sample Interval (feet)		Analytes*	Unit	Sample Result	Soil Concentration, Proctective of Groundwater*	Result> Soil Concentration?	Background Concentration	Results> Background Concentration?	Contaminants Retained?
			Top	Bottom								
U_Shallow	C7676	B26JK7	0	1	Lithium	µg/kg	7,360	192,128	No	13,300	No	No
U_Shallow	C7676	B26JK7	0	1	Mercury	µg/kg	20.6	2,090	No	13.1	Yes	No
U_Shallow	C7676	B26JK7	0	1	Nitrite	µg/kg	982	—	ND	—	ND	No
U_Shallow	C7676	B26JK7	0	1	Selenium	µg/kg	1,000	5,200	No	780	Yes	No
U_Shallow	C7676	B26JK7	0	1	Strontium	µg/kg	49,600	6,758,400	No	—	ND	No
U_Shallow	C7676	B26JL7	0	1	Styrene	µg/kg	0.377	2,244	No	—	ND	No
U_Shallow	C7676	B26JL7	0	1	Toluene	µg/kg	0.738	4,654	No	—	ND	No
U_Shallow	C7676	B29612	5	9	Aluminum	µg/kg	8,270,000	480,064,000	No	11,800,000	No	No
U_Shallow	C7676	B29612	5	9	Antimony	µg/kg	291	5,424	No	130	Yes	No
U_Shallow	C7676	B29612	5	9	Arsenic	µg/kg	7,000	2,920	Yes	20,000	No	No
U_Shallow	C7676	B29612	5	9	Barium	µg/kg	83,600	1,648,000	No	132,000	No	No
U_Shallow	C7676	B29612	5	9	Beryllium	µg/kg	235	63,216	No	1,510	No	No
U_Shallow	C7676	B29612	5	9	Chloride	µg/kg	621	—	ND	100,000	No	No
U_Shallow	C7676	B29612	5	9	Chromium	µg/kg	10,000	480,096,000	No	18,500	No	No
U_Shallow	C7676	B29612	5	9	Cobalt	µg/kg	8,730	4,339	Yes	15,700	No	No
U_Shallow	C7676	B29612	5	9	Copper	µg/kg	13,200	284,160	No	22,000	No	No
U_Shallow	C7676	B29612	5	9	Fluoride	µg/kg	1,810	2,883,840	No	2,810	No	No
U_Shallow	C7676	B29612	5	9	Hexavalent Chromium	µg/kg	10,000	192	Yes	18,500	No	No
U_Shallow	C7676	B29612	5	9	Iron	µg/kg	23,100,000	5,644,800	Yes	32,600,000	No	No
U_Shallow	C7676	B29612	5	9	Lead	µg/kg	7,000	3,000,060	No	10,200	No	No
U_Shallow	C7676	B29612	5	9	Lithium	µg/kg	9,240	192,128	No	13,300	No	No
U_Shallow	C7676	B29612	5	9	Manganese	µg/kg	364,000	500,736	No	512,000	No	No
U_Shallow	C7676	B29612	5	9	Mercury	µg/kg	10.2	2,090	No	13.1	No	No
U_Shallow	C7676	B29612	5	9	Molybdenum	µg/kg	2,530	32,320	No	470	Yes	No
U_Shallow	C7676	B29612	5	9	Nickel	µg/kg	9,800	130,400	No	19,100	No	No
U_Shallow	C7676	B29612	5	9	Nitrate	µg/kg	7,370	—	ND	52,000	No	No
U_Shallow	C7676	B29612	5	9	Nitrite	µg/kg	2,190	—	ND	—	ND	No
U_Shallow	C7676	B29612	5	9	Phosphorus	µg/kg	882,000	—	ND	—	ND	No
U_Shallow	C7676	B29612	5	9	Selenium	µg/kg	2,000	5,200	No	780	Yes	No
U_Shallow	C7676	B29612	5	9	Strontium	µg/kg	36,800	6,758,400	No	—	ND	No
U_Shallow	C7676	B29612	5	9	Sulfate	µg/kg	9,940	—	ND	237,000	No	No
U_Shallow	C7676	B29612	5	9	Vanadium	µg/kg	51,900	1,600,320	No	85,100	No	No
U_Shallow	C7676	B29612	5	9	Zinc	µg/kg	45,300	5,971,200	No	67,800	No	No

*Soil samples were not analyzed for hexavalent chromium. Based on the Washington State Department of Ecology's comment, total chromium measurements are assumed to be in hexavalent form. Therefore, total chromium sample results were compared against soil concentration, protective of groundwater for hexavalent chromium.

ND = not determined

APPENDIX I

WMA C EPC DIFFERENCES BETWEEN USING PROUCL V4.00.05 AND PROUCL V5.1

Table of Contents

Table 1: Summary of ProUCL v5.1 UCL Recommendations I-1

Table 2: WMA C EPC Differences between using ProUCL v4.00.05 and ProUCL v5.1..... I-21

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
A+B_Shallow	Aluminum	7429-90-5	8	ug/kg	8	8	0	--	--	6710000	7860000	7271250	7230000	0.057096	7549336.6	95% Student's-t UCL	
A+B_Shallow	Americium-241	14596-10-2	8	pCi/g	3	3	5	0.0164	0.0339	0.0381	0.176	0.0917	0.061	0.805871	0.0872195	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
A+B_Shallow	Antimony	7440-36-0	8	ug/kg	8	8	0	--	--	114	342	213.75	221	0.360427	265.35491	95% Student's-t UCL	
A+B_Shallow	Aroclor-1254	11097-69-1	7	ug/kg	2	2	5	5.38	5.98	6.46	8.59	7.525	7.525	0.200151	7.1601751	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
A+B_Shallow	Arsenic	7440-38-2	8	ug/kg	8	8	0	--	--	2400	5220	3098.75	2830	0.296209	3713.5759	95% Student's-t UCL	
A+B_Shallow	Barium	7440-39-3	8	ug/kg	8	8	0	--	--	66100	100000	78150	77300	0.13091	85002.828	95% Student's-t UCL	
A+B_Shallow	Cadmium	7440-43-9	8	ug/kg	8	8	0	--	--	39.3	117	76.2125	82.9	0.40194	96.731458	95% Student's-t UCL	
A+B_Shallow	Carbon-14	14762-75-5	8	pCi/g	3	3	5	0.916	2.24	1.23	3.39	2.2833333	2.23	0.473425	2.1806906	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
A+B_Shallow	Cesium-137	10045-97-3	8	pCi/g	2	2	6	0.0808	0.185	4.37	27.7	16.035	16.035	1.0288	23.774231	95% KM (Chebyshev) UCL	Warning: Data set has only 2 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
A+B_Shallow	Chromium	7440-47-3	8	ug/kg	8	8	0	--	--	5970	11100	8463.75	8140	0.189264	9536.7463	95% Student's-t UCL	
A+B_Shallow	Cobalt	7440-48-4	8	ug/kg	8	8	0	--	--	6470	11400	7831.25	7005	0.222273	9452.7424	95% Adjusted Gamma UCL	
A+B_Shallow	Copper	7440-50-8	8	ug/kg	8	8	0	--	--	10800	14200	12012.5	11650	0.092425	12756.191	95% Student's-t UCL	
A+B_Shallow	Diethylphthalate	84-66-2	4	ug/kg	1	1	3	200	300	340	340	340	340	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Diethylphthalate was not processed!
A+B_Shallow	Fluoride	16984-48-8	8	ug/kg	4	4	4	310	1900	717	2750	1615	1496.5	0.591262	1741.182	95% KM (t) UCL	
A+B_Shallow	Iron	7439-89-6	8	ug/kg	8	7	0	--	--	21200000	26200000	23025000	22900000	0.068425	24080312	95% Student's-t UCL	
A+B_Shallow	Lead	7439-92-1	8	ug/kg	8	8	0	--	--	2920	7210	4717.5	4810	0.318033	5722.4673	95% Student's-t UCL	
A+B_Shallow	Lithium	7439-93-2	8	ug/kg	8	8	0	--	--	7100	8640	7990	7995	0.063842	8331.6814	95% Student's-t UCL	
A+B_Shallow	Manganese	7439-96-5	8	ug/kg	8	8	0	--	--	299000	377000	336000	327500	0.080002	354005.62	95% Student's-t UCL	
A+B_Shallow	Nickel	7440-02-0	8	ug/kg	8	8	0	--	--	7530	12200	9711.25	9680	0.173999	10843.1	95% Student's-t UCL	
A+B_Shallow	Nitrate	14797-55-8	8	ug/kg	6	6	2	4340	4380	1710	16100	6741.6667	4955	0.761895	9063.0705	95% KM (t) UCL	
A+B_Shallow	Nitrite	14797-65-0	8	ug/kg	4	4	4	558	3280	342	1080	657.75	604.5	0.556706	898.84392	95% KM (t) UCL	
A+B_Shallow	Plutonium-239/240	PU-239/240	8	pCi/g	1	1	7	0.0279	0.0538	0.313	0.313	0.313	0.313	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-239/240 was not processed!
A+B_Shallow	Plutonium-241	14119-32-5	8	pCi/g	1	1	7	0.10407	0.20067	1.16749	1.16749	1.16749	1.16749	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-241 was not processed!
A+B_Shallow	Selenium-79	15758-45-9	8	pCi/g	2	2	6	1.15	2.66	2.19	2.7	2.445	2.445	0.147495	2.0642957	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
A+B_Shallow	Silver	7440-22-4	8	ug/kg	8	7	0	--	--	28.6	52.5	41.4875	45.6	0.244087	48.270613	95% Student's-t UCL	
A+B_Shallow	Strontium	7440-24-6	8	ug/kg	8	7	0	--	--	30100	45000	34425	33300	0.143731	37739.304	95% Student's-t UCL	

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
A+B_Shallow	Strontium-90	10098-97-2	8	pCi/g	2	2	6	0.179	0.648	11.8	24	17.9	17.9	0.481939	22.605729	95% KM (Chebyshev) UCL	Warning: Data set has only 2 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
A+B_Shallow	Tin	7440-31-5	3	ug/kg	3	3	0	--	--	6900	11600	9430	9790	0.251388	13426.471	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
A+B_Shallow	Tin-126	15832-50-5	8	pCi/g	8	8	0	--	--	14.1	47	24.9375	24.4	0.407074	31.737271	95% Student's-t UCL	
A+B_Shallow	Uranium-234	13966-29-5	8	pCi/g	7	7	1	0.141	0.141	0.171	0.329	0.2288571	0.24	0.240727	0.2582917	95% KM (t) UCL	
A+B_Shallow	Uranium-235	15117-96-1	8	pCi/g	8	8	0	--	--	0.00599	0.0113	0.0077388	0.00723	0.223723	0.0088985	95% Student's-t UCL	
A+B_Shallow	Uranium-238	U-238	8	pCi/g	8	8	0	--	--	0.136	0.244	0.16825	0.1535	0.215255	0.1925091	95% Student's-t UCL	
A+B_Shallow	Vanadium	7440-62-2	8	ug/kg	8	8	0	--	--	48300	66500	56387.5	56200	0.094986	59975.149	95% Student's-t UCL	
A+B_Shallow	Zinc	7440-66-6	8	ug/kg	8	8	0	--	--	41200	47500	43850	43300	0.059255	45590.466	95% Student's-t UCL	
C_Shallow	Aluminum	7429-90-5	3	ug/kg	3	3	0	--	--	8270000	9510000	9073333.3	9440000	0.076773	10247677	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Antimony	7440-36-0	3	ug/kg	3	3	0	--	--	175	721	393	283	0.735734	880.45396	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Arsenic	7440-38-2	3	ug/kg	3	3	0	--	--	3810	21200	10570	6700	0.881605	26279.748	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Barium	7440-39-3	3	ug/kg	3	3	0	--	--	81500	98800	88533.333	85300	0.102695	103861.02	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Beryllium	7440-41-7	3	ug/kg	3	3	0	--	--	323	403	360.33333	355	0.111746	428.21558	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Butylbenzylphthalate	85-68-7	3	ug/kg	1	1	2	48.3	49.9	80.7	80.7	80.7	80.7	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Butylbenzylphthalate was not processed!
C_Shallow	Cadmium	7440-43-9	3	ug/kg	3	3	0	--	--	94.9	150	117.96667	109	0.24264	166.22168	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Cesium-137	10045-97-3	3	pCi/g	1	1	2	0.104	0.151	7.09	7.09	7.09	7.09	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Cesium-137 was not processed!
C_Shallow	Chromium	7440-47-3	3	ug/kg	3	3	0	--	--	9290	12800	10896.667	10600	0.162775	13886.877	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Cobalt	7440-48-4	3	ug/kg	3	3	0	--	--	9010	11000	9870	9600	0.103557	11593.121	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
C_Shallow	Copper	7440-50-8	3	ug/kg	3	3	0	--	--	13200	18100	15466.667	15100	0.15973	19631.557	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Fluoride	16984-48-8	3	ug/kg	3	3	0	--	--	557	2290	1629	2040	0.57505	3208.2353	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Iron	7439-89-6	3	ug/kg	3	3	0	--	--	22800000	28600000	25033333	23700000	0.124691	30295612	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Lead	7439-92-1	3	ug/kg	3	3	0	--	--	3710	10600	6800	6090	0.514624	12699.551	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Lithium	7439-93-2	3	ug/kg	3	3	0	--	--	7800	12100	9546.6667	8740	0.2368	13357.792	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Manganese	7439-96-5	3	ug/kg	3	3	0	--	--	373000	449000	410000	408000	0.092779	474128.98	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Mercury	7439-97-6	3	ug/kg	2	2	1	0.982	0.982	3.9	5.06	4.48	4.48	0.18309	7.404328	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Nickel	7440-02-0	3	ug/kg	3	3	0	--	--	10800	13000	11900	11900	0.092437	13754.44	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Nickel-63	13981-37-8	3	pCi/g	1	1	2	3.14	3.37	4.5	4.5	4.5	4.5	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Nickel-63 was not processed!
C_Shallow	Nitrate	14797-55-8	3	ug/kg	3	3	0	--	--	4210	17400	10736.667	10600	0.614349	21856.667	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Nitrite	14797-65-0	3	ug/kg	3	3	0	--	--	1180	2110	1780	2050	0.292405	2657.4544	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Silver	7440-22-4	3	ug/kg	3	3	0	--	--	40	80	55.3	45.9	0.390475	91.703137	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Strontium	7440-24-6	3	ug/kg	3	3	0	--	--	33100	44700	38166.667	36700	0.155566	48176.346	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Strontium-90	10098-97-2	3	pCi/g	1	1	2	0.184	0.562	3	3	3	3	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Strontium-90 was not processed!

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
C_Shallow	Tin-126	15832-50-5	3	pCi/g	3	3	0	--	--	20.7	53.1	32.933333	25	0.534312	62.598783	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Uranium-235	15117-96-1	3	pCi/g	3	3	0	--	--	0.00832	0.013	0.0101767	0.00921	0.24421	0.0143664	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Uranium-238	U-238	3	pCi/g	3	3	0	--	--	0.18	0.282	0.217	0.189	0.260236	0.3122023	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Vanadium	7440-62-2	3	ug/kg	3	3	0	--	--	49000	78500	59966.667	52400	0.269152	87176.552	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
C_Shallow	Zinc	7440-66-6	3	ug/kg	3	3	0	--	--	44600	51100	46833.333	44800	0.078927	53064.917	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Acetone	67-64-1	4	ug/kg	3	3	1	1.71	1.71	4.14	6.63	5.2	4.83	0.247226	6.8690176	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Aldrin	309-00-2	4	ug/kg	1	1	3	0.31	0.32	2	2	2	2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Aldrin was not processed!
E_Shallow	Aluminum	7429-90-5	4	ug/kg	4	4	0	--	--	6810000	7420000	7120000	7125000	0.035364	7416280.9	95% Student's-t UCL	
E_Shallow	Antimony	7440-36-0	4	ug/kg	4	4	0	--	--	92.6	178	147.9	160.5	0.256162	192.48014	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Arsenic	7440-38-2	4	ug/kg	4	4	0	--	--	2990	5200	4162.5	4230	0.272913	5499.2082	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Barium	7440-39-3	4	ug/kg	4	4	0	--	--	75000	78400	76600	76500	0.018215	78241.742	95% Student's-t UCL	
E_Shallow	Beryllium	7440-41-7	4	ug/kg	4	3	0	--	--	147	159	155.5	158	0.036568	162.1909	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Beryllium	7440-41-7	4	ug/kg	4	3	0	--	--	147	159	155.5	158	0.036568	161.72698	95% Modified-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Boron	7440-42-8	4	ug/kg	2	2	2	2980	2990	3250	3340	3295	3295	0.019314	3404.8878	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Butylbenzylphthalate	85-68-7	4	ug/kg	3	3	1	118	118	121	124	122.66667	123	0.012453	124.80205	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
E_Shallow	Cadmium	7440-43-9	4	ug/kg	4	4	0	--	--	2700	3260	3002.5	3025	0.08746	3311.4957	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Cesium-137	10045-97-3	4	pCi/g	1	1	3	0.414	0.49	5.13	5.13	5.13	5.13	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Cesium-137 was not processed!
E_Shallow	Chromium	7440-47-3	4	ug/kg	4	4	0	--	--	7980	17200	11870	11150	0.328821	16462.718	95% Student's-t UCL	
E_Shallow	Cobalt	7440-48-4	4	ug/kg	4	4	0	--	--	7620	8820	8137.5	8055	0.061676	8728.0626	95% Student's-t UCL	
E_Shallow	Copper	7440-50-8	4	ug/kg	4	4	0	--	--	12000	16500	13525	12800	0.149392	15902.509	95% Student's-t UCL	
E_Shallow	Fluoride	16984-48-8	4	ug/kg	4	4	0	--	--	995	1480	1278.75	1320	0.169307	1533.5034	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Iron	7439-89-6	4	ug/kg	4	4	0	--	--	21600000	24200000	22575000	22250000	0.050165	23907563	95% Student's-t UCL	
E_Shallow	Lithium	7439-93-2	4	ug/kg	4	4	0	--	--	7030	9130	7827.5	7575	0.116812	8903.3919	95% Student's-t UCL	
E_Shallow	Manganese	7439-96-5	4	ug/kg	4	4	0	--	--	298000	495000	364000	331500	0.24382	468431.19	95% Student's-t UCL	
E_Shallow	Mercury	7439-97-6	4	ug/kg	1	1	3	9.18	9.9	23.2	23.2	23.2	23.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Mercury was not processed!
E_Shallow	Nickel	7440-02-0	4	ug/kg	4	4	0	--	--	7820	12400	10217.5	10325	0.193575	12544.8	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Nitrate	14797-55-8	4	ug/kg	4	4	0	--	--	2850	5020	3912.5	3890	0.229287	4968.0814	95% Student's-t UCL	
E_Shallow	Nitrite	14797-65-0	4	ug/kg	4	4	0	--	--	724	1400	1053.5	1045	0.262384	1378.7605	95% Student's-t UCL	
E_Shallow	Selenium	7782-49-2	4	ug/kg	4	4	0	--	--	210	560	354.5	324	0.417429	528.62372	95% Student's-t UCL	
E_Shallow	Selenium-79	15758-45-9	4	pCi/g	4	4	0	--	--	1.58	3.77	2.285	1.895	0.447482	3.4881535	95% Student's-t UCL	
E_Shallow	Silver	7440-22-4	4	ug/kg	4	4	0	--	--	66.7	85	75.275	74.7	0.099852	84.119376	95% Student's-t UCL	
E_Shallow	Strontium	7440-24-6	4	ug/kg	4	4	0	--	--	28900	34700	31375	30950	0.080184	34335.276	95% Student's-t UCL	
E_Shallow	Strontium-90	10098-97-2	4	pCi/g	1	1	3	0.217	0.669	2.5	2.5	2.5	2.5	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Strontium-90 was not processed!
E_Shallow	Tin-126	15832-50-5	4	pCi/g	4	4	0	--	--	3.75	18.5	7.9625	4.8	0.890854	16.309205	95% Student's-t UCL	
E_Shallow	Toluene	108-88-3	4	ug/kg	4	4	0	--	--	0.232	0.337	0.27225	0.26	0.180752	0.330154	95% Student's-t UCL	
E_Shallow	Uranium-233	13968-55-3	4	pCi/g	4	4	0	--	--	1.59	2	1.815	1.835	0.106504	2.042458	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
E_Shallow	Uranium-234	13966-29-5	4	pCi/g	3	3	1	0.124	0.124	0.191	0.449	0.2923333	0.237	0.47074	0.4254631	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
E_Shallow	Uranium-235	15117-96-1	4	pCi/g	4	4	0	--	--	0.00826	0.0116	0.0097325	0.009535	0.159512	0.0115592	95% Student's-t UCL	
E_Shallow	Uranium-236	13982-70-2	4	pCi/g	1	1	3	0.00102	0.00103	0.00121	0.00121	0.00121	0.00121	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Uranium-236 was not processed!
E_Shallow	Uranium-238	U-238	4	pCi/g	4	4	0	--	--	0.19	0.276	0.22475	0.2165	0.179724	0.2722795	95% Student's-t UCL	
E_Shallow	Vanadium	7440-62-2	4	ug/kg	4	4	0	--	--	50000	58800	54125	53850	0.067588	58429.549	95% Student's-t UCL	
E_Shallow	Zinc	7440-66-6	4	ug/kg	4	4	0	--	--	39800	44800	42175	42050	0.048607	44587.198	95% Student's-t UCL	

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
F+G_Shallow	2-Butanone	78-93-3	8	ug/kg	2	2	6	1.32	3.91	2.47	2.5	2.485	2.485	0.008537	2.1858936	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Aluminum	7429-90-5	8	ug/kg	8	8	0	--	--	4480000	7440000	6120000	6245000	0.156325	6760834.6	95% Student's-t UCL	
F+G_Shallow	Antimony	7440-36-0	8	ug/kg	4	4	4	162	200	120	262	202.25	213.5	0.320086	207.25014	95% KM (t) UCL	
F+G_Shallow	Aroclor-1260	11096-82-5	8	ug/kg	1	1	7	6.4	19.6	20.6	20.6	20.6	20.6	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Aroclor-1260 was not processed!
F+G_Shallow	Arsenic	7440-38-2	8	ug/kg	8	8	0	--	--	1920	4300	2920	2935	0.290205	3487.6175	95% Student's-t UCL	
F+G_Shallow	Barium	7440-39-3	8	ug/kg	8	8	0	--	--	40600	129000	77212.5	73650	0.326626	94105.446	95% Student's-t UCL	
F+G_Shallow	Beryllium	7440-41-7	8	ug/kg	3	3	5	185	864	185	298	231.33333	211	0.255824	247.27192	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
F+G_Shallow	beta-BHC	319-85-7	5	ug/kg	4	4	1	0.31	0.31	21.3	25.3	23.75	24.2	0.079926	29.510014	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Bis(2-ethylhexyl) phthalate	117-81-7	8	ug/kg	4	4	4	538	579	667	7420	3179.25	2315	0.932023	3594.4507	95% KM (t) UCL	
F+G_Shallow	Butylbenzylphthalate	85-68-7	8	ug/kg	2	2	6	45.6	49.4	48.8	72.6	60.7	60.7	0.277251	58.285539	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Cadmium	7440-43-9	8	ug/kg	6	6	2	111	117	73.3	143	102.66667	103.1	0.27142	116.52973	95% KM (t) UCL	
F+G_Shallow	Carbon-14	14762-75-5	8	pCi/g	3	3	5	2.72	52.5	3.51	12.5	7.36	6.07	0.629314	10.657801	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
F+G_Shallow	Cesium-137	10045-97-3	8	pCi/g	2	2	6	0.313	0.402	2.07	4.75	3.41	3.41	0.555732	4.3544543	95% KM (Chebyshev) UCL	Warning: Data set has only 2 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
F+G_Shallow	Chromium	7440-47-3	8	ug/kg	8	8	0	--	--	4740	9720	7796.25	8210	0.226096	8976.9678	95% Student's-t UCL	
F+G_Shallow	Cobalt	7440-48-4	8	ug/kg	8	8	0	--	--	5360	8760	7317.5	7305	0.176667	8183.4337	95% Student's-t UCL	
F+G_Shallow	Copper	7440-50-8	8	ug/kg	8	8	0	--	--	10100	15600	11875	11300	0.145213	13030.066	95% Student's-t UCL	
F+G_Shallow	Fluoride	16984-48-8	8	ug/kg	8	8	0	--	--	695	3290	1448.375	1155	0.571046	2002.3876	95% Student's-t UCL	
F+G_Shallow	Gamma-BHC (Lindane)	58-89-9	2	ug/kg	1	1	1	0.17	0.17	5.1	5.1	5.1	5.1	0	--		Warning: This data set only has 2 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Gamma-BHC (Lindane) was not processed!
F+G_Shallow	Hexane	110-54-3	4	ug/kg	4	4	0	--	--	2.12	35.9	11.5025	3.995	1.420313	--		Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Iron	7439-89-6	8	ug/kg	8	7	0	--	--	15200000	25900000	21137500	22700000	0.198489	23947828	95% Student's-t UCL	
F+G_Shallow	Lead	7439-92-1	8	ug/kg	6	6	2	4380	5230	3370	8480	5315	5215	0.37214	6159.2846	95% KM (t) UCL	
F+G_Shallow	Lithium	7439-93-2	8	ug/kg	8	8	0	--	--	3350	7910	6310	6635	0.264309	7427.1417	95% Student's-t UCL	
F+G_Shallow	Manganese	7439-96-5	8	ug/kg	8	8	0	--	--	229000	500000	329250	309000	0.258618	386286.33	95% Student's-t UCL	
F+G_Shallow	Mercury	7439-97-6	8	ug/kg	1	1	7	8.96	28.9	30.4	30.4	30.4	30.4	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Mercury was not processed!

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
F+G_Shallow	Methylene chloride	75-09-2	8	ug/kg	3	1	5	0.053	0.855	2	2	2	2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Methylene chloride was not processed!
F+G_Shallow	Nickel	7440-02-0	8	ug/kg	8	8	0	--	--	6400	12400	9796.25	9725	0.222078	11253.497	95% Student's-t UCL	
F+G_Shallow	Nitrate	14797-55-8	8	ug/kg	8	8	0	--	--	3250	11400	5331.25	4675	0.473695	7022.8424	95% Student's-t UCL	
F+G_Shallow	Nitrate	14797-55-8	8	ug/kg	8	8	0	--	--	3250	11400	5331.25	4675	0.473695	7154.244	95% Modified-t UCL	
F+G_Shallow	Nitrite	14797-65-0	8	ug/kg	8	8	0	--	--	1180	4080	2383.75	2225	0.422962	3059.1019	95% Student's-t UCL	
F+G_Shallow	o-Xylene	95-47-6	8	ug/kg	1	1	7	0.0762	0.294	0.128	0.128	0.128	0.128	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable o-Xylene was not processed!
F+G_Shallow	Selenium-79	15758-45-9	8	pCi/g	1	1	7	1.26	2.82	2.42	2.42	2.42	2.42	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Selenium-79 was not processed!
F+G_Shallow	Silver	7440-22-4	8	ug/kg	2	2	6	84.2	136	70.7	81.8	76.25	76.25	0.102936	86.764911	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Strontium	7440-24-6	8	ug/kg	8	8	0	--	--	21700	49700	30300	27450	0.28963	36178.321	95% Student's-t UCL	
F+G_Shallow	Strontium-90	10098-97-2	8	pCi/g	2	2	6	0.226	4.06	0.295	0.3	0.2975	0.2975	0.011884	0.3259017	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Styrene	100-42-5	4	ug/kg	4	4	0	--	--	0.245	0.654	0.36525	0.281	0.533314	0.5944592	95% Student's-t UCL	
F+G_Shallow	Tin	7440-31-5	1	ug/kg	1	1	0	--	--	6360	6360	6360	6360	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Tin was not processed!
F+G_Shallow	Tin-126	15832-50-5	8	pCi/g	1	1	7	2.36	9.72	2.55	2.55	2.55	2.55	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Tin-126 was not processed!
F+G_Shallow	Toluene	108-88-3	8	ug/kg	3	3	5	0.119	0.359	0.238	0.978	0.4873333	0.246	0.871988	0.4958568	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
F+G_Shallow	Uranium-233	13968-55-3	8	pCi/g	8	8	0	--	--	0.619	2.21	1.11275	1.001	0.454711	1.4516729	95% Student's-t UCL	
F+G_Shallow	Uranium-234	13966-29-5	8	pCi/g	5	5	3	0.106	0.116	0.176	0.423	0.2674	0.259	0.375619	0.2859524	95% KM (t) UCL	
F+G_Shallow	Uranium-235	15117-96-1	8	pCi/g	8	8	0	--	--	0.00579	0.0149	0.008245	0.006885	0.386507	0.0103796	95% Student's-t UCL	
F+G_Shallow	Uranium-235	15117-96-1	8	pCi/g	8	8	0	--	--	0.00579	0.0149	0.008245	0.006885	0.386507	0.0104926	95% Modified-t UCL	
F+G_Shallow	Uranium-236	13982-70-2	8	pCi/g	2	2	6	0.00089	0.00101	0.00129	0.0013	0.001295	0.001295	0.00546	0.001156	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
F+G_Shallow	Uranium-238	U-238	8	pCi/g	8	8	0	--	--	0.132	0.34	0.18725	0.1575	0.388715	0.2360052	95% Student's-t UCL	
F+G_Shallow	Uranium-238	U-238	8	pCi/g	8	8	0	--	--	0.132	0.34	0.18725	0.1575	0.388715	0.2386213	95% Modified-t UCL	
F+G_Shallow	Vanadium	7440-62-2	8	ug/kg	8	8	0	--	--	31600	78500	57175	57850	0.328067	69739.241	95% Student's-t UCL	
F+G_Shallow	Xylenes (total)	1330-20-7	8	ug/kg	1	1	7	0.168	0.912	0.463	0.463	0.463	0.463	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Xylenes (total) was not processed!

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
F+G_Shallow	Zinc	7440-66-6	8	ug/kg	8	7	0	--	--	28500	43100	35500	35200	0.119264	38335.998	95% Student's-t UCL	
H+I_Shallow	Aluminum	7429-90-5	8	ug/kg	8	8	0	--	--	4590000	7730000	6338750	6240000	0.156956	7005173.6	95% Student's-t UCL	
H+I_Shallow	Amylene Hydrate	75-85-4	4	ug/kg	4	3	0	--	--	210	260	232.5	230	0.088669	256.75791	95% Student's-t UCL	
H+I_Shallow	Antimony	7440-36-0	8	ug/kg	8	8	0	--	--	77.9	420	180.325	156.5	0.625031	255.82115	95% Student's-t UCL	
H+I_Shallow	Arsenic	7440-38-2	8	ug/kg	8	8	0	--	--	2000	7000	3946.25	3350	0.406077	5019.6465	95% Student's-t UCL	
H+I_Shallow	Barium	7440-39-3	8	ug/kg	8	8	0	--	--	71000	103000	83712.5	81400	0.120585	90474.128	95% Student's-t UCL	
H+I_Shallow	Beryllium	7440-41-7	8	ug/kg	7	6	1	99.6	99.6	136	212	184.28571	190	0.147104	200.14088	95% KM (t) UCL	
H+I_Shallow	Butylbenzylphthalate	85-68-7	8	ug/kg	1	1	7	48.1	50	200	200	200	200	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Butylbenzylphthalate was not processed!
H+I_Shallow	Cadmium	7440-43-9	8	ug/kg	8	8	0	--	--	66.1	196	108.475	93.85	0.398588	137.43654	95% Student's-t UCL	
H+I_Shallow	Carbon-14	14762-75-5	8	pCi/g	1	1	7	1.29	2.54	3.49	3.49	3.49	3.49	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Carbon-14 was not processed!
H+I_Shallow	Chromium	7440-47-3	8	ug/kg	8	7	0	--	--	5340	26800	11448.75	9595	0.593574	18591.647	95% Adjusted Gamma UCL	
H+I_Shallow	Cobalt	7440-48-4	8	ug/kg	8	8	0	--	--	6680	11300	9087.5	8990	0.179611	10180.816	95% Student's-t UCL	
H+I_Shallow	Copper	7440-50-8	8	ug/kg	8	6	0	--	--	9970	13500	11533.75	11300	0.085403	12193.547	95% Student's-t UCL	
H+I_Shallow	Di-n-butylphthalate	84-74-2	8	ug/kg	1	1	7	558	562	570	570	570	570	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Di-n-butylphthalate was not processed!
H+I_Shallow	Fluoride	16984-48-8	8	ug/kg	8	8	0	--	--	372	2100	1303.5	1470	0.404774	1656.9202	95% Student's-t UCL	
H+I_Shallow	Iron	7439-89-6	8	ug/kg	8	8	0	--	--	14300000	31200000	22487500	22550000	0.239077	26088701	95% Student's-t UCL	
H+I_Shallow	Lead	7439-92-1	8	ug/kg	8	8	0	--	--	2460	11300	6013.75	5985	0.448212	7819.2458	95% Student's-t UCL	
H+I_Shallow	Lithium	7439-93-2	8	ug/kg	8	8	0	--	--	3560	8010	6626.25	6920	0.211064	7563.0539	95% Student's-t UCL	
H+I_Shallow	Manganese	7439-96-5	8	ug/kg	8	7	0	--	--	270000	465000	367375	364500	0.165279	408046.93	95% Student's-t UCL	
H+I_Shallow	Molybdenum	7439-98-7	8	ug/kg	2	2	6	1650	2000	1980	2000	1990	1990	0.007107	1916.029	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
H+I_Shallow	Nickel	7440-02-0	8	ug/kg	8	8	0	--	--	6610	18300	10737.5	10005	0.326075	13082.746	95% Student's-t UCL	
H+I_Shallow	Nitrate	14797-55-8	8	ug/kg	8	8	0	--	--	2750	54600	17073.75	11850	0.953014	38621.98	95% Adjusted Gamma UCL	
H+I_Shallow	Nitrite	14797-65-0	8	ug/kg	7	7	1	192	192	232	1850	1014.4286	1120	0.525403	1299.2463	95% KM (t) UCL	
H+I_Shallow	Selenium	7782-49-2	8	ug/kg	8	5	0	--	--	523	1000	838.125	982.5	0.257388	982.62374	95% Student's-t UCL	
H+I_Shallow	Selenium	7782-49-2	8	ug/kg	8	5	0	--	--	523	1000	838.125	982.5	0.257388	979.50642	95% Modified-t UCL	
H+I_Shallow	Selenium-79	15758-45-9	8	pCi/g	2	2	6	1.38	2.99	2.23	2.65	2.44	2.44	0.121715	2.2304878	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
H+I_Shallow	Silver	7440-22-4	8	ug/kg	4	4	4	100	100	59.1	66.7	62.5	62.1	0.050343	65.480576	95% KM (t) UCL	
H+I_Shallow	Strontium	7440-24-6	8	ug/kg	8	8	0	--	--	20200	37700	29050	30800	0.223195	33393.092	95% Student's-t UCL	
H+I_Shallow	Styrene	100-42-5	8	ug/kg	7	7	1	0.318	0.318	0.273	0.464	0.3561429	0.333	0.191027	0.3939148	95% KM (t) UCL	
H+I_Shallow	Tin-126	15832-50-5	8	pCi/g	7	7	1	2.43	2.43	3.42	9.76	6.4342857	6.77	0.363626	7.6850633	95% KM (t) UCL	
H+I_Shallow	Toluene	108-88-3	8	ug/kg	7	7	1	0.52	0.52	0.267	1.05	0.478	0.386	0.572702	0.7900514	95% KM Adjusted Gamma UCL	
H+I_Shallow	Toluene	108-88-3	8	ug/kg	7	7	1	0.52	0.52	0.267	1.05	0.478	0.386	0.572702	0.7189745	95% GROS Adjusted Gamma UCL	
H+I_Shallow	Tritium	10028-17-8	8	pCi/g	4	4	4	4.03	63.7	2.91	75.8	21.675	3.995	1.665395	73.567361	97.5% KM (Chebyshev) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
H+I_Shallow	Tritium	10028-17-8	8	pCi/g	4	4	4	4.03	63.7	2.91	75.8	21.675	3.995	1.665395	109.79699	99% KM (Chebyshev) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
H+I_Shallow	Uranium-233	13968-55-3	8	pCi/g	8	8	0	--	--	0.575	1.97	1.358125	1.37	0.317906	1.6473306	95% Student's-t UCL	
H+I_Shallow	Uranium-234	13966-29-5	8	pCi/g	3	3	5	0.123	0.124	0.262	0.345	0.3036667	0.304	0.136666	0.2644958	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
H+I_Shallow	Uranium-235	15117-96-1	8	pCi/g	8	8	0	--	--	0.00642	0.00813	0.007375	0.007325	0.076631	0.0077536	95% Student's-t UCL	
H+I_Shallow	Uranium-236	13982-70-2	8	pCi/g	3	3	5	0.00102	0.00103	0.00135	0.0021	0.00173	0.00174	0.216821	0.0016075	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
H+I_Shallow	Uranium-238	U-238	8	pCi/g	8	6	0	--	--	0.157	0.193	0.17225	0.169	0.08423	0.1819684	95% Student's-t UCL	
H+I_Shallow	Vanadium	7440-62-2	8	ug/kg	8	7	0	--	--	24500	82600	52625	52850	0.38366	66149.015	95% Student's-t UCL	
H+I_Shallow	Zinc	7440-66-6	8	ug/kg	8	8	0	--	--	29500	53000	40162.5	40250	0.17184	44785.391	95% Student's-t UCL	
J_Shallow	Aluminum	7429-90-5	3	ug/kg	3	3	0	--	--	6890000	7740000	7180000	6910000	0.06756	7997769.7	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Antimony	7440-36-0	3	ug/kg	3	3	0	--	--	219	2160	870.66667	233	1.282486	2753.121	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
J_Shallow	Arsenic	7440-38-2	3	ug/kg	3	3	0	--	--	3270	7890	5483.3333	5290	0.422382	9387.8731	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Barium	7440-39-3	3	ug/kg	3	3	0	--	--	77800	244000	133766.67	79500	0.713695	294712.92	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
J_Shallow	Beryllium	7440-41-7	3	ug/kg	3	3	0	--	--	134	328	207.33333	160	0.507906	384.86376	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Bis(2-ethylhexyl) phthalate	117-81-7	3	ug/kg	1	1	2	579	585	2070	2070	2070	2070	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Bis(2-ethylhexyl) phthalate was not processed!
J_Shallow	Boron	7440-42-8	3	ug/kg	3	3	0	--	--	5610	43900	18826.667	6970	1.153937	55451.498	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Butylbenzylphthalate	85-68-7	3	ug/kg	1	1	2	49	49.5	77.8	77.8	77.8	77.8	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Butylbenzylphthalate was not processed!
J_Shallow	Cadmium	7440-43-9	3	ug/kg	3	3	0	--	--	84	113	99.666667	102	0.146891	124.34779	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
J_Shallow	Carbon-14	14762-75-5	3	pCi/g	1	1	2	3.06	3.39	13.7	13.7	13.7	13.7	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Carbon-14 was not processed!
J_Shallow	Cesium-137	10045-97-3	3	pCi/g	1	1	2	0.0753	0.0763	5.71	5.71	5.71	5.71	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Cesium-137 was not processed!
J_Shallow	Chromium	7440-47-3	3	ug/kg	3	3	0	--	--	9580	11600	10560	10500	0.09577	12264.965	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Cobalt	7440-48-4	3	ug/kg	3	3	0	--	--	6340	8270	7186.6667	6950	0.137272	8849.8057	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Copper	7440-50-8	3	ug/kg	3	3	0	--	--	12100	13800	12700	12200	0.075113	14308.203	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Fluoride	16984-48-8	3	ug/kg	3	3	0	--	--	502	1530	1024	1040	0.502136	1890.844	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Iron	7439-89-6	3	ug/kg	3	3	0	--	--	18700000	24100000	21466667	21600000	0.125891	26022634	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Lead	7439-92-1	3	ug/kg	3	3	0	--	--	4900	5290	5063.3333	5000	0.040007	5404.8316	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Lithium	7439-93-2	3	ug/kg	3	3	0	--	--	7300	8680	7813.3333	7460	0.096605	9085.8278	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Manganese	7439-96-5	3	ug/kg	3	3	0	--	--	287000	383000	336666.67	340000	0.142832	417733.89	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Mercury	7439-97-6	3	ug/kg	2	2	1	9.14	9.14	11.5	16.2	13.85	13.85	0.239957	19.276384	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Nickel	7440-02-0	3	ug/kg	3	3	0	--	--	10200	13700	11533.333	10700	0.16413	14724.604	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Nitrate	14797-55-8	3	ug/kg	3	3	0	--	--	3240	9230	7130	8920	0.472988	12815.38	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Nitrite	14797-65-0	3	ug/kg	3	3	0	--	--	1220	2500	1756.6667	1550	0.378305	2877.0096	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
J_Shallow	Plutonium-238	13981-16-3	3	pCi/g	1	1	2	0.0298	0.0384	0.0666	0.0666	0.0666	0.0666	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-238 was not processed!
J_Shallow	Plutonium-239/240	PU-239/240	3	pCi/g	1	1	2	0.0317	0.0402	0.0378	0.0378	0.0378	0.0378	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-239/240 was not processed!
J_Shallow	Plutonium-241	14119-32-5	3	pCi/g	1	1	2	0.11824	0.14995	0.140994	0.140994	0.140994	0.140994	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-241 was not processed!
J_Shallow	Selenium-79	15758-45-9	3	pCi/g	3	3	0	--	--	3.76	11.3	6.75	5.19	0.593298	13.501442	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Silver	7440-22-4	3	ug/kg	3	3	0	--	--	57.7	62.4	59.633333	58.8	0.041224	63.777702	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Strontium	7440-24-6	3	ug/kg	3	3	0	--	--	33100	125000	63966.667	33800	0.82633	153076.85	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
J_Shallow	Strontium-90	10098-97-2	3	pCi/g	1	1	2	0.686	0.754	4.01	4.01	4.01	4.01	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Strontium-90 was not processed!
J_Shallow	Tin	7440-31-5	2	ug/kg	2	2	0	--	--	3030	3600	3315	3315	0.121584	--		Warning: This data set only has 2 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Tin was not processed!
J_Shallow	Uranium-235	15117-96-1	3	pCi/g	3	3	0	--	--	0.00834	0.0097	0.0089533	0.00882	0.077037	0.0101161	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Uranium-238	U-238	3	pCi/g	3	3	0	--	--	0.191	0.217	0.2006667	0.194	0.070886	0.2246469	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Vanadium	7440-62-2	3	ug/kg	3	3	0	--	--	41900	54300	47966.667	47700	0.129346	58426.213	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
J_Shallow	Zinc	7440-66-6	3	ug/kg	3	3	0	--	--	34300	52300	43333.333	43400	0.207697	58506.335	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
L1+L2_Shallow	1-Butanol	71-36-3	8	ug/kg	1	1	7	7.69	14.1	22.2	22.2	22.2	22.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable 1-Butanol was not processed!
L1+L2_Shallow	2-(2-Butoxyethoxy)ethanol	112-34-5	1	ug/kg	1	1	0	--	--	230	230	230	230	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable 2-(2-Butoxyethoxy)ethanol was not processed!

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
L1+L2_Shallow	2-(2-ethoxyethoxy)ethanol	111-90-0	2	ug/kg	2	2	0	--	--	210	250	230	230	0.122975	--		Warning: This data set only has 2 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable 2-(2-ethoxyethoxy)ethanol was not processed!
L1+L2_Shallow	Acetone	67-64-1	8	ug/kg	1	1	7	1.81	3.98	46.2	46.2	46.2	46.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Acetone was not processed!
L1+L2_Shallow	Aluminum	7429-90-5	7	ug/kg	7	7	0	--	--	5110000	7070000	5787142.9	5410000	0.133839	6356011.7	95% Student's-t UCL	
L1+L2_Shallow	Aluminum	7429-90-5	7	ug/kg	7	7	0	--	--	5110000	7070000	5787142.9	5410000	0.133839	6377290.6	95% Modified-t UCL	
L1+L2_Shallow	Aluminum	7429-90-5	7	ug/kg	7	7	0	--	--	5110000	7070000	5787142.9	5410000	0.133839	6397264.4	95% H-UCL	
L1+L2_Shallow	Antimony	7440-36-0	8	ug/kg	5	5	3	156	174	74.1	500	207.38	96.8	0.895739	269.36145	95% KM (t) UCL	
L1+L2_Shallow	Arsenic	7440-38-2	8	ug/kg	8	8	0	--	--	1800	4520	2907.5	2475	0.355096	3599.0652	95% Student's-t UCL	
L1+L2_Shallow	Barium	7440-39-3	8	ug/kg	8	8	0	--	--	46600	106000	69200	62750	0.307335	83445.741	95% Student's-t UCL	
L1+L2_Shallow	Beryllium	7440-41-7	8	ug/kg	4	4	4	177	198	111	216	147	130.5	0.327804	163.88006	95% KM (t) UCL	
L1+L2_Shallow	beta-BHC	319-85-7	8	ug/kg	4	4	4	0.3	0.35	19.4	23.4	21.2	21	0.094654	18.888331	95% KM (t) UCL	
L1+L2_Shallow	Bis(2-ethylhexyl) phthalate	117-81-7	8	ug/kg	1	1	7	531	589	1840	1840	1840	1840	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Bis(2-ethylhexyl) phthalate was not processed!
L1+L2_Shallow	Butylbenzylphthalate	85-68-7	8	ug/kg	2	2	6	45	80.4	53.6	59.2	56.4	56.4	0.070209	54.938487	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
L1+L2_Shallow	Cadmium	7440-43-9	8	ug/kg	8	8	0	--	--	32.3	120	75.725	66.8	0.392785	95.648332	95% Student's-t UCL	
L1+L2_Shallow	Carbon-14	14762-75-5	8	pCi/g	3	3	5	2.58	60.4	4.69	53.8	34.063333	43.7	0.761361	36.796864	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
L1+L2_Shallow	Cesium-137	10045-97-3	8	pCi/g	3	3	5	0.228	0.339	0.444	7.52	3.4746667	2.46	1.049163	3.4200208	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
L1+L2_Shallow	Chromium	7440-47-3	8	ug/kg	8	8	0	--	--	7540	11100	8777.5	8430	0.153212	9678.3058	95% Student's-t UCL	
L1+L2_Shallow	Cobalt	7440-48-4	8	ug/kg	8	8	0	--	--	4340	10700	6766.25	5570	0.329557	8259.8888	95% Student's-t UCL	
L1+L2_Shallow	Copper	7440-50-8	8	ug/kg	8	8	0	--	--	8020	15100	10791.25	10600	0.191488	12175.392	95% Student's-t UCL	
L1+L2_Shallow	Fluoride	16984-48-8	8	ug/kg	8	8	0	--	--	379	1660	979.25	1025	0.434084	1263.9809	95% Student's-t UCL	
L1+L2_Shallow	Hexane	110-54-3	4	ug/kg	4	4	0	--	--	20.2	60.5	39.625	38.9	0.435536	59.932307	95% Student's-t UCL	
L1+L2_Shallow	Iron	7439-89-6	8	ug/kg	8	7	0	--	--	12600000	25900000	18200000	16400000	0.234955	21064334	95% Student's-t UCL	
L1+L2_Shallow	Lead	7439-92-1	8	ug/kg	8	8	0	--	--	3040	6430	4401.25	3950	0.308978	5312.1508	95% Student's-t UCL	
L1+L2_Shallow	Lithium	7439-93-2	8	ug/kg	8	8	0	--	--	5550	7440	6675	6730	0.088203	7069.3663	95% Student's-t UCL	
L1+L2_Shallow	Manganese	7439-96-5	8	ug/kg	8	8	0	--	--	169000	450000	292625	251000	0.322738	355884.94	95% Student's-t UCL	
L1+L2_Shallow	Mercury	7439-97-6	8	ug/kg	2	2	6	8.63	48.1	10.2	17.1	13.65	13.65	0.357439	15.829101	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
L1+L2_Shallow	Molybdenum	7439-98-7	8	ug/kg	2	2	6	2090	3950	2260	2450	2355	2355	0.057049	2421.5153	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
L1+L2_Shallow	Nickel	7440-02-0	8	ug/kg	8	8	0	--	--	7330	18400	10608.75	9390	0.355045	13131.741	95% Student's-t UCL	
L1+L2_Shallow	Nickel-63	13981-37-8	8	pCi/g	1	1	7	13.4	70.6	390	390	390	390	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Nickel-63 was not processed!

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
L1+L2_Shallow	Nitrate	14797-55-8	8	ug/kg	8	8	0	--	--	1920	12000	5148.75	4035	0.594107	7197.7136	95% Student's-t UCL	
L1+L2_Shallow	Nitrite	14797-65-0	8	ug/kg	6	6	2	240	643	1250	5180	2518.3333	2175	0.549645	3029.846	95% KM (t) UCL	
L1+L2_Shallow	Selenium	7782-49-2	8	ug/kg	1	1	7	216	656	1350	1350	1350	1350	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Selenium was not processed!
L1+L2_Shallow	Selenium-79	15758-45-9	8	pCi/g	1	1	7	0.894	2.68	1.6	1.6	1.6	1.6	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Selenium-79 was not processed!
L1+L2_Shallow	Silver	7440-22-4	8	ug/kg	4	4	4	81.6	86.1	52	102	77.8	78.6	0.294523	83.498598	95% KM (t) UCL	
L1+L2_Shallow	Strontium	7440-24-6	8	ug/kg	8	8	0	--	--	19000	33300	27912.5	27500	0.165428	31005.458	95% Student's-t UCL	
L1+L2_Shallow	Strontium-90	10098-97-2	8	pCi/g	3	3	5	0.29	2.97	0.117	4.01	1.859	1.45	1.064263	2.0248811	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
L1+L2_Shallow	Tin-126	15832-50-5	8	pCi/g	2	2	6	2.37	9.38	3.44	8.94	6.19	6.19	0.628286	8.9085899	95% KM (Chebyshev) UCL	Warning: Data set has only 2 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
L1+L2_Shallow	Tritium	10028-17-8	8	pCi/g	1	1	7	3.85	306	4.65	4.65	4.65	4.65	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Tritium was not processed!
L1+L2_Shallow	Uranium-233	13968-55-3	8	pCi/g	8	8	0	--	--	0.443	2.08	1.139875	1.16	0.456756	1.4886207	95% Student's-t UCL	
L1+L2_Shallow	Uranium-234	13966-29-5	8	pCi/g	5	5	3	0.123	0.13	0.144	0.286	0.2184	0.238	0.278545	0.2298916	95% KM (t) UCL	
L1+L2_Shallow	Uranium-235	15117-96-1	8	pCi/g	8	8	0	--	--	0.00465	0.0143	0.0077913	0.006495	0.408853	0.009925	95% Student's-t UCL	
L1+L2_Shallow	Uranium-236	13982-70-2	8	pCi/g	1	1	7	0.00092	0.00111	0.00134	0.00134	0.00134	0.00134	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Uranium-236 was not processed!
L1+L2_Shallow	Uranium-238	U-238	8	pCi/g	8	7	0	--	--	0.106	0.327	0.1795	0.1445	0.41515	0.2294157	95% Student's-t UCL	
L1+L2_Shallow	Vanadium	7440-62-2	8	ug/kg	8	8	0	--	--	32000	71600	45250	36700	0.356877	56066.949	95% Student's-t UCL	
L1+L2_Shallow	Vanadium	7440-62-2	8	ug/kg	8	8	0	--	--	32000	71600	45250	36700	0.356877	56389.602	95% Modified-t UCL	
L1+L2_Shallow	Vanadium	7440-62-2	8	ug/kg	8	8	0	--	--	32000	71600	45250	36700	0.356877	59114.684	95% H-UCL	
L1+L2_Shallow	Zinc	7440-66-6	8	ug/kg	8	8	0	--	--	24200	43400	33375	31500	0.207288	38009.082	95% Student's-t UCL	
P_Shallow	1,2-Propanediol	57-55-6	4	ug/kg	4	4	0	--	--	250	910	570	560	0.57655	956.69707	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
P_Shallow	2-(2-ethoxyethoxy)ethanol	111-90-0	1	ug/kg	1	1	0	--	--	230	230	230	230	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable 2-(2-ethoxyethoxy)ethanol was not processed!
P_Shallow	Acetone	67-64-1	11	ug/kg	7	7	4	2.88	3.65	4.18	13.1	8.9657143	9.39	0.434648	9.1759432	95% KM (t) UCL	
P_Shallow	Aluminum	7429-90-5	10	ug/kg	10	10	0	--	--	5650000	7800000	6657000	6795000	0.122128	7128284.4	95% Student's-t UCL	
P_Shallow	Americium-241	14596-10-2	11	pCi/g	1	1	10	0.852	1.97	2.2	2.2	2.2	2.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Americium-241 was not processed!
P_Shallow	Antimony	7440-36-0	10	ug/kg	3	3	7	149	171	174	367	241.66667	184	0.449615	222.61624	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Normal GOF Test on Detects Only

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
P_Shallow	Aroclor-1260	11096-82-5	8	ug/kg	2	2	6	10	21	25.2	26.8	26	26	0.043514	20.573942	95% KM (t) UCL	Warning: One or more Recommended UCL(s) not available! Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
P_Shallow	Arsenic	7440-38-2	10	ug/kg	10	10	0	--	--	1790	5900	4399	4360	0.260754	5063.9283	95% Student's-t UCL	
P_Shallow	Barium	7440-39-3	10	ug/kg	10	10	0	--	--	66100	86100	77210	78500	0.095908	81502.551	95% Student's-t UCL	
P_Shallow	Benzoic acid	65-85-0	1	ug/kg	1	1	0	--	--	300	300	300	300	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Benzoic acid was not processed!
P_Shallow	Beryllium	7440-41-7	10	ug/kg	6	6	4	183	1010	191	315	260.16667	261.5	0.17111	267.51983	95% KM (t) UCL	
P_Shallow	beta-BHC	319-85-7	4	ug/kg	4	3	0	--	--	21.2	25.8	23	22.5	0.085421	25.311813	95% Student's-t UCL	
P_Shallow	Bis(2-ethylhexyl) phthalate	117-81-7	8	ug/kg	2	2	6	549	599	804	2300	1552	1552	0.681593	2048.9048	95% KM (Chebyshev) UCL	Warning: Data set has only 2 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
P_Shallow	Cadmium	7440-43-9	10	ug/kg	10	10	0	--	--	76.8	145	109.34	107	0.180407	120.77464	95% Student's-t UCL	
P_Shallow	Cesium-137	10045-97-3	10	pCi/g	7	7	3	0.522	3.08	0.332	73.1	24.973571	19.1	1.002076	31.65083	95% KM (t) UCL	
P_Shallow	Chromium	7440-47-3	10	ug/kg	10	10	0	--	--	4470	21800	9408	8890	0.505656	13030.209	95% Adjusted Gamma UCL	
P_Shallow	Cobalt	7440-48-4	10	ug/kg	10	10	0	--	--	6370	9900	8544	8465	0.123709	9156.7047	95% Student's-t UCL	
P_Shallow	Cobalt-60	10198-40-0	10	pCi/g	1	1	9	0.2	3.13	0.833	0.833	0.833	0.833	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Cobalt-60 was not processed!
P_Shallow	Copper	7440-50-8	10	ug/kg	10	8	0	--	--	11300	13200	12460	12550	0.042837	12769.405	95% Student's-t UCL	
P_Shallow	Di-n-butylphthalate	84-74-2	8	ug/kg	1	1	7	523	571	863	863	863	863	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Di-n-butylphthalate was not processed!
P_Shallow	Fluoride	16984-48-8	9	ug/kg	9	8	0	--	--	1340	4760	2194.4444	1910	0.469235	3045.7391	95% Adjusted Gamma UCL	
P_Shallow	Iodine-129	15046-84-1	11	pCi/g	1	1	10	0.114	0.46	0.808	0.808	0.808	0.808	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Iodine-129 was not processed!
P_Shallow	Iron	7439-89-6	10	ug/kg	10	10	0	--	--	20000000	30500000	23540000	23300000	0.129491	25306987	95% Student's-t UCL	
P_Shallow	Lead	7439-92-1	10	ug/kg	10	10	0	--	--	2930	8060	6585	7075	0.235852	7485.294	95% Student's-t UCL	
P_Shallow	Lithium	7439-93-2	10	ug/kg	10	10	0	--	--	4190	9420	7419	8265	0.220244	8366.1929	95% Student's-t UCL	
P_Shallow	Manganese	7439-96-5	10	ug/kg	10	9	0	--	--	291000	385000	344200	352500	0.10065	364282.23	95% Student's-t UCL	
P_Shallow	Mercury	7439-97-6	10	ug/kg	1	1	9	10.2	17.5	19.2	19.2	19.2	19.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Mercury was not processed!
P_Shallow	Methylene chloride	75-09-2	11	ug/kg	3	3	8	0.224	0.405	0.795	2.61	1.515	1.14	0.636211	1.0491153	95% KM (t) UCL	Warning: Data set has only 3 Detected Values. This is not enough to compute meaningful or reliable statistics and estimates. Normal GOF Test on Detects Only
P_Shallow	Neptunium-237	13994-20-2	10	pCi/g	1	1	9	0.137	0.145	1.46	1.46	1.46	1.46	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Neptunium-237 was not processed!
P_Shallow	Nickel	7440-02-0	10	ug/kg	10	10	0	--	--	6710	13900	9681	9310	0.254434	11108.859	95% Student's-t UCL	

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Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
P_Shallow	Nickel-63	13981-37-8	11	pCi/g	1	1	10	40.8	112	85	85	85	85	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Nickel-63 was not processed!
P_Shallow	Nitrate	14797-55-8	9	ug/kg	9	9	0	--	--	3700	17500	8647.7778	8080	0.520214	11436.292	95% Student's-t UCL	
P_Shallow	Nitrite	14797-65-0	9	ug/kg	8	8	1	1240	1240	1670	5760	3933.75	4030	0.346515	4608.7437	95% KM (t) UCL	
P_Shallow	Plutonium-239/240	PU-239/240	11	pCi/g	1	1	10	0.569	1.48	10.7	10.7	10.7	10.7	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-239/240 was not processed!
P_Shallow	Plutonium-241	14119-32-5	11	pCi/g	1	1	10	2.12237	5.5204	39.911	39.911	39.911	39.911	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Plutonium-241 was not processed!
P_Shallow	Selenium-79	15758-45-9	11	pCi/g	7	7	4	1.23	7.58	1.98	8.69	3.9885714	2.84	0.608288	4.4871536	95% KM (t) UCL	
P_Shallow	Silver	7440-22-4	10	ug/kg	7	7	3	137	153	100	223	164	160	0.310637	176.65287	95% KM (t) UCL	
P_Shallow	Strontium	7440-24-6	10	ug/kg	10	10	0	--	--	26300	39100	30400	28750	0.148727	33020.917	95% Student's-t UCL	
P_Shallow	Strontium-90	10098-97-2	11	pCi/g	8	8	3	3.43	8.79	2.2	141	69.5375	70.45	0.68747	79.515373	95% KM (t) UCL	
P_Shallow	Technetium-99	14133-76-7	10	pCi/g	1	1	9	17.3	19.3	24	24	24	24	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Technetium-99 was not processed!
P_Shallow	Tin	7440-31-5	4	ug/kg	4	4	0	--	--	7750	14400	9830	8585	0.316659	13492.726	95% Student's-t UCL	
P_Shallow	Toluene	108-88-3	11	ug/kg	1	1	10	0.158	0.4	0.294	0.294	0.294	0.294	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Toluene was not processed!
P_Shallow	Tritium	10028-17-8	10	pCi/g	1	1	9	262	442	308	308	308	308	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Tritium was not processed!
P_Shallow	Uranium-233	13968-55-3	10	pCi/g	10	10	0	--	--	0.751	2.57	1.5714	1.47	0.366683	1.9054152	95% Student's-t UCL	
P_Shallow	Uranium-234	13966-29-5	10	pCi/g	9	9	1	0.121	0.121	0.149	1.39	0.5237778	0.424	0.692019	0.869254	95% KM Adjusted Gamma UCL	
P_Shallow	Uranium-234	13966-29-5	10	pCi/g	9	9	1	0.121	0.121	0.149	1.39	0.5237778	0.424	0.692019	1.0030645	95% GROS Adjusted Gamma UCL	
P_Shallow	Uranium-235	15117-96-1	10	pCi/g	10	10	0	--	--	0.00823	0.0426	0.018633	0.0143	0.580435	0.0249024	95% Student's-t UCL	
P_Shallow	Uranium-236	13982-70-2	10	pCi/g	9	9	1	0.001	0.001	0.00263	0.0561	0.0194744	0.00919	1.014501	0.0290138	95% KM (t) UCL	
P_Shallow	Uranium-238	U-238	10	pCi/g	10	10	0	--	--	0.194	0.878	0.4017	0.329	0.519764	0.5227311	95% Student's-t UCL	
P_Shallow	Vanadium	7440-62-2	10	ug/kg	10	10	0	--	--	56700	110000	67680	60700	0.240641	77121.028	95% Student's-t UCL	
P_Shallow	Vanadium	7440-62-2	10	ug/kg	10	10	0	--	--	56700	110000	67680	60700	0.240641	77755.908	95% Modified-t UCL	
P_Shallow	Zinc	7440-66-6	10	ug/kg	10	10	0	--	--	39500	305000	69130	43300	1.199442	183423.79	95% Chebyshev (Mean, Sd) UCL	
R_Shallow	2-Hexanone	591-78-6	3	ug/kg	3	3	0	--	--	2.08	2.77	2.4566667	2.52	0.142198	3.0455907	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Acetone	67-64-1	4	ug/kg	2	2	2	2.12	2.58	2.53	6.4	4.465	4.465	0.612879	8.823523	95% KM (Chebyshev) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
R_Shallow	Aluminum	7429-90-5	3	ug/kg	3	3	0	--	--	6770000	8390000	7620000	7700000	0.106687	8990528.1	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Antimony	7440-36-0	2	ug/kg	2	2	0	--	--	161	245	203	203	0.292596	--		Warning: This data set only has 2 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Antimony was not processed!
R_Shallow	Arsenic	7440-38-2	3	ug/kg	3	3	0	--	--	4900	5830	5326.6667	5250	0.088182	6118.5398	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Barium	7440-39-3	3	ug/kg	3	3	0	--	--	66800	79200	73066.667	73200	0.084869	83520.777	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Beryllium	7440-41-7	3	ug/kg	3	3	0	--	--	156	175	165.66667	166	0.057371	181.68968	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Butylbenzylphthalate	85-68-7	3	ug/kg	2	2	1	109	109	76.1	107	91.55	91.55	0.238663	136.66378	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Cadmium	7440-43-9	3	ug/kg	3	3	0	--	--	2990	3470	3160	3020	0.085091	3613.3037	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Chromium	7440-47-3	3	ug/kg	3	3	0	--	--	9250	11200	10150	10000	0.096908	11808.233	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Cobalt	7440-48-4	3	ug/kg	3	2	0	--	--	8370	10500	9790	10500	0.125614	11863.19	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
R_Shallow	Copper	7440-50-8	3	ug/kg	3	3	0	--	--	11000	14800	13100	13500	0.147429	16355.926	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Fluoride	16984-48-8	3	ug/kg	3	3	0	--	--	964	3530	2394.6667	2690	0.546316	4600.1775	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Iron	7439-89-6	3	ug/kg	3	3	0	--	--	22100000	25900000	24600000	25800000	0.088034	28250955	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Lead	7439-92-1	3	ug/kg	3	3	0	--	--	4310	8450	6353.3333	6300	0.325894	9843.9206	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Lithium	7439-93-2	3	ug/kg	3	3	0	--	--	7290	9050	8113.3333	8000	0.109136	9606.0842	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Manganese	7439-96-5	3	ug/kg	3	3	0	--	--	331000	409000	375333.33	386000	0.106783	442900.84	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
R_Shallow	Mercury	7439-97-6	3	ug/kg	1	1	2	7.78	7.85	13.5	13.5	13.5	13.5	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Mercury was not processed!
R_Shallow	Methylene chloride	75-09-2	4	ug/kg	1	1	3	0.0521	0.0749	1.4	1.4	1.4	1.4	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Methylene chloride was not processed!
R_Shallow	Nickel	7440-02-0	3	ug/kg	3	3	0	--	--	8690	11000	10196.667	10900	0.128058	12398.004	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Nitrate	14797-55-8	3	ug/kg	3	3	0	--	--	6710	39700	18540	9210	0.990706	49505.236	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Nitrite	14797-65-0	3	ug/kg	2	2	1	1900	1900	387	5310	2848.5	2848.5	1.222077	--		Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Selenium	7782-49-2	3	ug/kg	3	3	0	--	--	594	701	660	685	0.087447	757.29878	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Silver	7440-22-4	3	ug/kg	3	3	0	--	--	51.9	69.4	58.1	53	0.168701	74.623954	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Strontium	7440-24-6	3	ug/kg	3	3	0	--	--	29900	37300	32733.333	31000	0.121983	39464.799	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Strontium-90	10098-97-2	1	pCi/g	1	1	0	--	--	0.371	0.371	0.371	0.371	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Strontium-90 was not processed!
R_Shallow	Toluene	108-88-3	4	ug/kg	3	3	1	0.6	0.6	0.316	0.592	0.4173333	0.344	0.364007	0.6237388	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Tritium	10028-17-8	2	pCi/g	1	1	1	3.88	3.88	2.5	2.5	2.5	2.5	0	--		Warning: This data set only has 2 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Tritium was not processed!
R_Shallow	Uranium-233	13968-55-3	3	pCi/g	3	3	0	--	--	1.84	2.36	2.1133333	2.14	0.123513	2.5533812	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Uranium-234	13966-29-5	3	pCi/g	2	2	1	0.136	0.136	0.212	0.223	0.2175	0.2175	0.035762	0.282555	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Uranium-235	15117-96-1	3	pCi/g	3	3	0	--	--	0.00672	0.0102	0.0084567	0.00845	0.205756	0.0113901	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
R_Shallow	Uranium-238	U-238	3	pCi/g	3	3	0	--	--	0.157	0.22	0.1896667	0.192	0.166422	0.2428802	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
R_Shallow	Vanadium	7440-62-2	3	ug/kg	3	3	0	--	--	55600	64200	61300	64100	0.080532	69622.386	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
R_Shallow	Zinc	7440-66-6	3	ug/kg	3	3	0	--	--	45300	48600	47233.333	47800	0.036445	50135.42	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Acetone	67-64-1	4	ug/kg	2	2	2	1.82	1.98	5.96	6.18	6.07	6.07	0.025628	7.4835365	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Aluminum	7429-90-5	3	ug/kg	3	3	0	--	--	4960000	8270000	6713333.3	6910000	0.247826	9518158.1	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Antimony	7440-36-0	3	ug/kg	3	3	0	--	--	151	291	223.66667	229	0.313646	341.93309	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Arsenic	7440-38-2	3	ug/kg	3	3	0	--	--	3000	7000	4666.6667	4000	0.446071	8176.0525	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Barium	7440-39-3	3	ug/kg	3	3	0	--	--	48100	96900	76200	83600	0.33107	118730	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Benzene	71-43-2	4	ug/kg	1	1	3	0.122	0.141	0.328	0.328	0.328	0.328	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Benzene was not processed!
U_Shallow	Beryllium	7440-41-7	3	ug/kg	3	3	0	--	--	126	235	194.33333	222	0.306352	294.6995	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Boron	7440-42-8	1	ug/kg	1	1	0	--	--	6420	6420	6420	6420	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Boron was not processed!
U_Shallow	Carbon-14	14762-75-5	3	pCi/g	1	1	2	1.25	2.22	1.66	1.66	1.66	1.66	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Carbon-14 was not processed!
U_Shallow	Cesium-137	10045-97-3	3	pCi/g	1	1	2	0.552	0.585	2.06	2.06	2.06	2.06	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Cesium-137 was not processed!
U_Shallow	Chromium	7440-47-3	3	ug/kg	3	3	0	--	--	7460	10000	8656.6667	8510	0.14744	10808.383	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
U_Shallow	Cobalt	7440-48-4	3	ug/kg	3	3	0	--	--	5540	8730	7593.3333	8510	0.234632	10596.915	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Copper	7440-50-8	3	ug/kg	3	3	0	--	--	9080	13200	11260	11500	0.183877	14750.492	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Fluoride	16984-48-8	3	ug/kg	3	3	0	--	--	402	2020	1410.6667	1810	0.62369	2893.9133	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Iron	7439-89-6	3	ug/kg	3	3	0	--	--	15500000	23100000	19833333	20900000	0.197177	26426152	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Lead	7439-92-1	3	ug/kg	3	3	0	--	--	3000	7000	4666.6667	4000	0.446071	8176.0525	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Lithium	7439-93-2	3	ug/kg	3	3	0	--	--	5520	9240	7373.3333	7360	0.252265	10509.083	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Manganese	7439-96-5	3	ug/kg	3	3	0	--	--	226000	364000	298000	304000	0.232199	414653.33	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Mercury	7439-97-6	3	ug/kg	2	2	1	9.66	9.66	10.2	20.6	15.4	15.4	0.477527	25.490224	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Molybdenum	7439-98-7	3	ug/kg	2	2	1	1980	1980	2380	2530	2455	2455	0.043204	2850.1247	95% KM (t) UCL	Warning: Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Neptunium-237	13994-20-2	3	pCi/g	1	1	2	0.278	0.28	0.603	0.603	0.603	0.603	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Neptunium-237 was not processed!
U_Shallow	Nickel	7440-02-0	3	ug/kg	3	3	0	--	--	6680	9800	8420	8780	0.188937	11101.94	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Nitrate	14797-55-8	3	ug/kg	3	3	0	--	--	6590	8510	7490	7370	0.12892	9117.8756	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Nitrite	14797-65-0	3	ug/kg	3	3	0	--	--	671	2190	1281	982	0.626408	2633.7771	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Selenium	7782-49-2	3	ug/kg	3	2	0	--	--	1000	2000	1333.3333	1000	0.433013	2306.6618	95% Student's-t UCL	Recommended UCL exceeds the maximum observation When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Table 1: Summary of ProUCL v5.1 UCL Recommendations

Exposure Area	Analyte	CAS No.	Total Samples	Units	Num Detects	Distinct Detects	Num Non-Detects	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Mean	Median	Coef. of Variation	UCL	UCL Basis	Comment
U_Shallow	Selenium-79	15758-45-9	3	pCi/g	1	1	2	2.25	2.94	2.8	2.8	2.8	2.8	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Selenium-79 was not processed!
U_Shallow	Strontium	7440-24-6	3	ug/kg	3	3	0	--	--	23000	49600	36466.667	36800	0.364803	58893.812	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Strontium-90	10098-97-2	3	pCi/g	1	1	2	0.211	0.211	4.2	4.2	4.2	4.2	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Strontium-90 was not processed!
U_Shallow	Styrene	100-42-5	1	ug/kg	1	1	0	--	--	0.377	0.377	0.377	0.377	0	--		Warning: This data set only has 1 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Styrene was not processed!
U_Shallow	Tin-126	15832-50-5	3	pCi/g	3	3	0	--	--	3.75	6.32	5.0666667	5.13	0.253849	7.2349621	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Toluene	108-88-3	4	ug/kg	4	4	0	--	--	0.555	0.738	0.64525	0.644	0.138475	0.7503876	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Uranium-233	13968-55-3	3	pCi/g	3	3	0	--	--	0.77	2.07	1.5733333	1.88	0.44629	2.7570785	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Uranium-234	13966-29-5	3	pCi/g	3	3	0	--	--	0.187	0.314	0.2486667	0.245	0.255681	0.3558522	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Uranium-235	15117-96-1	3	pCi/g	3	3	0	--	--	0.00562	0.00888	0.00731	0.00743	0.223435	0.0100635	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Uranium-236	13982-70-2	3	pCi/g	1	1	2	0.00102	0.00103	0.00155	0.00155	0.00155	0.00155	0	--		Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable Uranium-236 was not processed!
U_Shallow	Uranium-238	U-238	3	pCi/g	3	3	0	--	--	0.118	0.206	0.1683333	0.181	0.269387	0.2447815	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Vanadium	7440-62-2	3	ug/kg	3	3	0	--	--	38800	51900	46900	50000	0.150935	58833.897	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.
U_Shallow	Zinc	7440-66-6	3	ug/kg	3	3	0	--	--	28500	45300	38233.333	40900	0.227856	52919.954	95% Student's-t UCL	Recommended UCL exceeds the maximum observation Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness.

Table 2 WMA C EPC Differences between using ProUCL v4.00.05 and ProUCL v5.1

Exposure Area	Analyte Group	Analyte	CAS No.	Total Samples	Num Detects	Num Non-Detects	Units	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Version 4.0 EPC	Version 5.1 EPC	Percent Difference	EPC Basis (Version 4.00.05 | Version 5.1)
A+B_Shallow	non-Rad	Aroclor-1254	11097-69-1	7	2	5	ug/kg	5.4	6.0	6.5	8.6	7.5384556	7.1601751	-5.0	95% KM (t) UCL
A+B_Shallow	non-Rad	Arsenic	7440-38-2	8	8	0	ug/kg	--	--	2,400	5,220	3750.7342	3713.5759	-1.0	95% Approximate Gamma UCL | 95% Student's-t UCL
A+B_Shallow	non-Rad	Cobalt	7440-48-4	8	8	0	ug/kg	--	--	6,470	11,400	9093.9161	9452.7424	3.9	95% Approximate Gamma UCL | 95% Adjusted Gamma UCL
A+B_Shallow	non-Rad	Fluoride	16984-48-8	8	4	4	ug/kg	310	1,900	717	2,750	2225	1741.182	-21.7	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
A+B_Shallow	non-Rad	Nitrite	14797-65-0	8	4	4	ug/kg	558	3,280	342	1,080	925.33333	898.84392	-2.9	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
A+B_Shallow	Rad	Americium-241	14596-10-2	8	3	5	pCi/g	0.016	0.034	0.038	0.18	0.176	0.0872195	-50.4	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
A+B_Shallow	Rad	Carbon-14	14762-75-5	8	3	5	pCi/g	0.92	2.2	1.2	3.4	3.39	2.1806906	-35.7	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
A+B_Shallow	Rad	Cesium-137	10045-97-3	8	2	6	pCi/g	0.081	0.19	4.4	27.7	27.7	23.774231	-14.2	95% KM (BCA) UCL | 95% KM (Chebyshev) UCL
A+B_Shallow	Rad	Selenium-79	15758-45-9	8	2	6	pCi/g	1.2	2.7	2.2	2.7	2.4135261	2.0642957	-14.5	95% KM (t) UCL
A+B_Shallow	Rad	Strontium-90	10098-97-2	8	2	6	pCi/g	0.18	0.65	11.8	24.0	17.147095	22.605729	31.8	95% KM (t) UCL | 95% KM (Chebyshev) UCL
A+B_Shallow	Rad	Uranium-234	13966-29-5	8	7	1	pCi/g	0.14	0.14	0.17	0.33	0.2588168	0.2582917	-0.2	95% KM (t) UCL
E_Shallow	non-Rad	Aluminum	7429-90-5	4	4	0	ug/kg	--	--	6,810,000	7,420,000	7420000	7416280.9	-0.1	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Barium	7440-39-3	4	4	0	ug/kg	--	--	75,000	78,400	78400	78241.742	-0.2	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Chromium	7440-47-3	4	4	0	ug/kg	--	--	7,980	17,200	17200	16462.718	-4.3	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Cobalt	7440-48-4	4	4	0	ug/kg	--	--	7,620	8,820	8820	8728.0626	-1.0	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Copper	7440-50-8	4	4	0	ug/kg	--	--	12,000	16,500	16500	15902.509	-3.6	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Iron	7439-89-6	4	4	0	ug/kg	--	--	21,600,000	24,200,000	24200000	23907563	-1.2	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Lithium	7439-93-2	4	4	0	ug/kg	--	--	7,030	9,130	9130	8903.3919	-2.5	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Manganese	7439-96-5	4	4	0	ug/kg	--	--	298,000	495,000	495000	468431.19	-5.4	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Nitrate	14797-55-8	4	4	0	ug/kg	--	--	2,850	5,020	5020	4968.0814	-1.0	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Nitrite	14797-65-0	4	4	0	ug/kg	--	--	724	1,400	1400	1378.7605	-1.5	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Selenium	7782-49-2	4	4	0	ug/kg	--	--	210	560	560	528.62372	-5.6	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Silver	7440-22-4	4	4	0	ug/kg	--	--	66.7	85.0	85	84.119376	-1.0	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Strontium	7440-24-6	4	4	0	ug/kg	--	--	28,900	34,700	34700	34335.276	-1.1	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Toluene	108-88-3	4	4	0	ug/kg	--	--	0.23	0.34	0.337	0.330154	-2.0	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	4	4	0	ug/kg	--	--	570	827	827.16622	816.07396	-1.3	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Vanadium	7440-62-2	4	4	0	ug/kg	--	--	50,000	58,800	58800	58429.549	-0.6	Maximum Detect | 95% Student's-t UCL
E_Shallow	non-Rad	Zinc	7440-66-6	4	4	0	ug/kg	--	--	39,800	44,800	44800	44587.198	-0.5	Maximum Detect | 95% Student's-t UCL
E_Shallow	Rad	Selenium-79	15758-45-9	4	4	0	pCi/g	--	--	1.6	3.8	3.77	3.4881535	-7.5	Maximum Detect | 95% Student's-t UCL
E_Shallow	Rad	Tin-126	15832-50-5	4	4	0	pCi/g	--	--	3.8	18.5	18.5	16.309205	-11.8	Maximum Detect | 95% Student's-t UCL
E_Shallow	Rad	Uranium-234	13966-29-5	4	3	1	pCi/g	0.12	0.12	0.19	0.45	0.449	0.4254631	-5.2	Maximum Detect | 95% KM (t) UCL
E_Shallow	Rad	Uranium-235	15117-96-1	4	4	0	pCi/g	--	--	0.0083	0.012	0.0116	0.0115592	-0.4	Maximum Detect | 95% Student's-t UCL
E_Shallow	Rad	Uranium-238	U-238	4	4	0	pCi/g	--	--	0.19	0.28	0.276	0.2722795	-1.3	Maximum Detect | 95% Student's-t UCL
F+G_Shallow	non-Rad	2-Butanone	78-93-3	8	2	6	ug/kg	1.3	3.9	2.5	2.5	2.4849168	2.1858936	-12.0	95% KM (t) UCL
F+G_Shallow	non-Rad	Antimony	7440-36-0	8	4	4	ug/kg	162	200	120	262	247.125	207.25014	-16.1	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	non-Rad	Beryllium	7440-41-7	8	3	5	ug/kg	185	864	185	298	298	247.27192	-17.0	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	non-Rad	beta-BHC	319-85-7	5	4	1	ug/kg	0.31	0.31	21.3	25.3	25.24	25.3	0.2	95% KM (Percentile Bootstrap) UCL | Maximum Detect
F+G_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	8	4	4	ug/kg	538	579	667	7,420	4032.5	3594.4507	-10.9	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	8	2	6	ug/kg	45.6	49.4	48.8	72.6	59.231218	58.285539	-1.6	95% KM (t) UCL
F+G_Shallow	non-Rad	Fluoride	16984-48-8	8	8	0	ug/kg	--	--	695	3,290	2112.0787	2002.3876	-5.2	95% Approximate Gamma UCL | 95% Student's-t UCL
F+G_Shallow	non-Rad	Styrene	100-42-5	4	4	0	ug/kg	--	--	0.25	0.65	0.654	0.5944592	-9.1	Maximum Detect | 95% Student's-t UCL
F+G_Shallow	non-Rad	Toluene	108-88-3	8	3	5	ug/kg	0.12	0.36	0.24	1.0	0.978	0.4958568	-49.3	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	Rad	Carbon-14	14762-75-5	8	3	5	pCi/g	2.7	52.5	3.5	12.5	12.5	10.657801	-14.7	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	Rad	Cesium-137	10045-97-3	8	2	6	pCi/g	0.31	0.40	2.1	4.8	3.2446078	4.3544543	34.2	95% KM (t) UCL | 95% KM (Chebyshev) UCL
F+G_Shallow	Rad	Uranium-234	13966-29-5	8	5	3	pCi/g	0.11	0.12	0.18	0.42	0.300375	0.2859524	-4.8	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
F+G_Shallow	Rad	Uranium-236	13982-70-2	8	2	6	pCi/g	0.00089	0.0010	0.0013	0.0013	0.0012944	0.001156	-10.7	95% KM (t) UCL
H+I_Shallow	non-Rad	Amylene Hydrate	75-85-4	4	4	0	ug/kg	--	--	210	260	260	256.75791	-1.2	Maximum Detect | 95% Student's-t UCL
H+I_Shallow	non-Rad	Beryllium	7440-41-7	8	7	1	ug/kg	100	100	136	212	198.79277	200.14088	0.7	95% KM (t) UCL
H+I_Shallow	non-Rad	Chromium	7440-47-3	8	8	0	ug/kg	--	--	5,340	26,800	16797.422	18591.647	10.7	95% Approximate Gamma UCL | 95% Adjusted Gamma UCL
H+I_Shallow	non-Rad	Molybdenum	7439-98-7	8	2	6	ug/kg	1,650	2,000	1,980	2,000	2000	1916.029	-4.2	95% KM (% Bootstrap) UCL | 95% KM (t) UCL

Table 2 WMA C EPC Differences between using ProUCL v4.00.05 and ProUCL v5.1

Exposure Area	Analyte Group	Analyte	CAS No.	Total Samples	Num Detects	Num Non-Detects	Units	Min Non-Detect	Max Non-Detect	Min Detect	Max Detect	Version 4.0 EPC	Version 5.1 EPC	Percent Difference	EPC Basis (Version 4.00.05 | Version 5.1)
H+I_Shallow	non-Rad	Nitrate	14797-55-8	8	8	0	ug/kg	--	--	2,750	54,600	32442.952	38621.98	19.0	95% Approximate Gamma UCL | 95% Adjusted Gamma UCL
H+I_Shallow	non-Rad	Nitrite	14797-65-0	8	7	1	ug/kg	192	192	232	1,850	1299.4761	1299.2463	0.0	95% KM (t) UCL
H+I_Shallow	non-Rad	Toluene	108-88-3	8	7	1	ug/kg	0.52	0.52	0.27	1.1	0.618125	0.7900514	27.8	95% KM (BCA) UCL | 95% KM Adjusted Gamma UCL
H+I_Shallow	Rad	Selenium-79	15758-45-9	8	2	6	pCi/g	1.4	3.0	2.2	2.7	2.65	2.2304878	-15.8	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
H+I_Shallow	Rad	Tin-126	15832-50-5	8	7	1	pCi/g	2.4	2.4	3.4	9.8	7.6912933	7.6850633	-0.1	95% KM (t) UCL
H+I_Shallow	Rad	Uranium-234	13966-29-5	8	3	5	pCi/g	0.12	0.12	0.26	0.35	0.345	0.2644958	-23.3	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
H+I_Shallow	Rad	Uranium-236	13982-70-2	8	3	5	pCi/g	0.0010	0.0010	0.0014	0.0021	0.0021	0.0016075	-23.5	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	non-Rad	beta-BHC	319-85-7	8	4	4	ug/kg	0.30	0.35	19.4	23.4	22.65	18.888331	-16.6	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	8	2	6	ug/kg	45.0	80.4	53.6	59.2	59.2	54.938487	-7.2	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	non-Rad	Hexane	110-54-3	4	4	0	ug/kg	--	--	20.2	60.5	60.5	59.932307	-0.9	Maximum Detect | 95% Student's-t UCL
L1+L2_Shallow	non-Rad	Mercury	7439-97-6	8	2	6	ug/kg	8.6	48.1	10.2	17.1	17.1	15.829101	-7.4	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	non-Rad	Molybdenum	7439-98-7	8	2	6	ug/kg	2,090	3,950	2,260	2,450	2450	2421.5153	-1.2	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	non-Rad	Nitrate	14797-55-8	8	8	0	ug/kg	--	--	1,920	12,000	7683.5868	7197.7136	-6.3	95% Approximate Gamma UCL | 95% Student's-t UCL
L1+L2_Shallow	non-Rad	Nitrite	14797-65-0	8	6	2	ug/kg	240	643	1,250	5,180	3099.6612	3029.846	-2.3	95% KM (t) UCL
L1+L2_Shallow	non-Rad	Silver	7440-22-4	8	4	4	ug/kg	81.6	86.1	52.0	102	93.975	83.498598	-11.1	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	Rad	Carbon-14	14762-75-5	8	3	5	pCi/g	2.6	60.4	4.7	53.8	53.8	36.796864	-31.6	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
L1+L2_Shallow	Rad	Cesium-137	10045-97-3	8	3	5	pCi/g	0.23	0.34	0.44	7.5	3.5000974	3.4200208	-2.3	95% KM (t) UCL
L1+L2_Shallow	Rad	Tin-126	15832-50-5	8	2	6	pCi/g	2.4	9.4	3.4	8.9	8.94	8.9085899	-0.4	95% KM (% Bootstrap) UCL | 95% KM (Chebyshev) UCL
L1+L2_Shallow	Rad	Uranium-234	13966-29-5	8	5	3	pCi/g	0.12	0.13	0.14	0.29	0.2525	0.2298916	-9.0	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	non-Rad	Acetone	67-64-1	11	7	4	ug/kg	2.9	3.7	4.2	13.1	9.8036364	9.1759432	-6.4	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	non-Rad	Antimony	7440-36-0	10	3	7	ug/kg	149	171	174	367	235.2249	222.61624	-5.4	95% KM (t) UCL
P_Shallow	non-Rad	Aroclor-1260	11096-82-5	8	2	6	ug/kg	10.0	21.0	25.2	26.8	26.8	20.573942	-23.2	95% KM (% Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	non-Rad	Beryllium	7440-41-7	10	6	4	ug/kg	183	1,010	191	315	276.11111	267.51983	-3.1	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	non-Rad	beta-BHC	319-85-7	4	4	0	ug/kg	--	--	21.2	25.8	25.8	25.311813	-1.9	Maximum Detect | 95% Student's-t UCL
P_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	8	2	6	ug/kg	549	599	804	2,300	2300	2048.9048	-10.9	95% KM (% Bootstrap) UCL | 95% KM (Chebyshev) UCL
P_Shallow	non-Rad	Chromium	7440-47-3	10	10	0	ug/kg	--	--	4,470	21,800	12403.863	13030.209	5.0	95% Approximate Gamma UCL | 95% Adjusted Gamma UCL
P_Shallow	non-Rad	Fluoride	16984-48-8	9	9	0	ug/kg	--	--	1,340	4,760	2872.7447	3045.7391	6.0	95% Approximate Gamma UCL | 95% Adjusted Gamma UCL
P_Shallow	non-Rad	Lead	7439-92-1	10	10	0	ug/kg	--	--	2,930	8,060	7803.3212	7485.294	-4.1	95% Approximate Gamma UCL | 95% Student's-t UCL
P_Shallow	non-Rad	Methylene chloride	75-09-2	11	3	8	ug/kg	0.22	0.41	0.80	2.6	1.3402566	1.0491153	-21.7	95% KM (t) UCL
P_Shallow	non-Rad	Nitrite	14797-65-0	9	8	1	ug/kg	1,240	1,240	1,670	5,760	4607.8627	4608.7437	0.0	95% KM (t) UCL
P_Shallow	non-Rad	Silver	7440-22-4	10	7	3	ug/kg	137	153	100	223	177.4	176.65287	-0.4	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	non-Rad	Strontium	7440-24-6	10	10	0	ug/kg	--	--	26,300	39,100	33141.815	33020.917	-0.4	95% Approximate Gamma UCL | 95% Student's-t UCL
P_Shallow	non-Rad	Tin	7440-31-5	4	4	0	ug/kg	--	--	7,750	14,400	14400	13492.726	-6.3	Maximum Detect | 95% Student's-t UCL
P_Shallow	Rad	Cesium-137	10045-97-3	10	7	3	pCi/g	0.52	3.1	0.33	73.1	32.1215	31.65083	-1.5	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	Rad	Selenium-79	15758-45-9	11	7	4	pCi/g	1.2	7.6	2.0	8.7	4.5721608	4.4871536	-1.9	95% KM (t) UCL
P_Shallow	Rad	Strontium-90	10098-97-2	11	8	3	pCi/g	3.4	8.8	2.2	141	82.218182	79.515373	-3.3	95% KM (Percentile Bootstrap) UCL | 95% KM (t) UCL
P_Shallow	Rad	Uranium-234	13966-29-5	10	9	1	pCi/g	0.12	0.12	0.15	1.4	0.7163	1.0030645	40.0	95% KM (BCA) UCL | 95% GROS Adjusted Gamma UCL
P_Shallow	Rad	Uranium-236	13982-70-2	10	9	1	pCi/g	0.0010	0.0010	0.0026	0.056	0.0290905	0.0290138	-0.3	95% KM (t) UCL

APPENDIX J

REVIEW COMMENT RECORD

RPP-RPT-58329, BASELINE RISK ASSESSMENT FOR WASTE MANAGEMENT AREA C, REV. 2

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LIST OF TABLES

Table J-1. Crosswalk of Report Organization Changes between Revisions 2 and 3 of RPP-RPT-58329 Resulting from Ecology's Review of this Documentation..... J-2

Table J-2. Review Comment Record – RPP-RPT-58329, *Baseline Risk Assessment for Waste Management Area C*, Rev. 2..... J-4

LIST OF TERMS

ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
BAF	bioaccumulation factor
BCG	Biota Concentration Guide
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BRA	baseline risk assessment
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CLARC	Cleanup Levels and Risk Calculation
CMS	corrective measures study
COPC	contaminant of potential concern
COPEC	contaminant of potential ecological concern
CR	concentration ratio
CRCIA	Columbia River Comprehensive Impact Assessment
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CUL	cleanup level

DOE	U.S. Department of Energy
DWS	drinking water standard
EA	exposure area
Ecology	State of Washington Department of Ecology
EcoSSL	Ecological Soil Screening Level
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERAGS	Ecological Risk Assessment Guidance for Superfund
EU	European Union
FGR	Federal Guidance Report
GW	groundwater
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
HSRAM	Hanford Site Risk Assessment Methodology
HR	home range
IAMIT	Interagency Management Integration Team
ICRP	International Commission on Radiological Protection
IRIS	Integrated Risk Information System
IUCN	International Union for Conservation of Nature and Natural Resources
LOAEL	Lowest-Observed-Adverse-Effects-Level

MCLG	maximum contaminant level goal
MDA	minimum detectable activity
MDL	method detection limit
MRL	minimal risk level
MTCA	*Model Toxics Control Act*
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No-Observed-Adverse-Effect-Level
NOEC	no-effect concentration
NRC	U.S. Nuclear Regulatory Commission
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PBT	persistent, bioaccumulative and toxic
PNEDR	Predicted No-Effect Dose Rate
POP	persistent organic pollutant
PPRTV	Provisional Peer Reviewed Toxicity Values
PRG	preliminary remediation goal
PRP	potentially responsible party
PUREX	Plutonium Uranium Extraction
RA	risk assessment
RAGS	Risk Assessment Guidance for Superfund
RAIS	Risk Assessment Information System
RCBRA	River Corridor Baseline Risk Assessment
RCRA	*Resource Conservation and Recovery Act of 1976*

RESRAD	RESidual RADioactivity (computer code)
RfD	reference dose
RFI	RCRA facility investigation
RSR	risk to source ratio
SLERA	screening level ecological risk assessment
SMDP	scientific management decision point
SOF	sum of the fractions (method)
SSL	soil screening level
STOMP	Subsurface Transport Over Multiple Phases (computer code)
SVOC	semi-volatile organic compound
TRV	toxicity reference value
UCL	upper confidence limit
UPR	unplanned release
USDOE	U.S. Department of Energy
VOC	volatile organic compound
WAC	*Washington Administrative Code*
WMA	Waste Management Area
WTP	Waste Treatment Plant

APPENDIX J

REVIEW COMMENT RECORD

RPP-RPT-58329, BASELINE RISK ASSESSMENT FOR WASTE MANAGEMENT AREA C, REV. 2

This Appendix provides a review comment record for comments received from the Washington State Department of Ecology (Ecology) during their review of RPP-RPT-58329, Rev. 2, *Baseline Risk Assessment for Waste Management Area C*.

This document, along with other related *Hanford Federal Facility Agreement and Consent Order* (HFFACO; Ecology et al. 1989) Appendix I analyses and documentation, was provided to Ecology in October 2016. To facilitate Ecology's review, the U.S. Department of Energy (DOE) provided a briefing to Ecology staff on an overview of the HFFACO Appendix I analyses and documentation and a second briefing of this specific analysis and document on November 29, 2016. On July 14, 2020, Ecology provided DOE comments on all of the HFFACO Appendix I documentation to DOE [Letter 17-NWP-085, "Re: Department of Ecology's (Ecology) Review and Comments of Appendix 1 Performance Assessment for Waste Management Area C (WMA C) Documents"].

In October of 2017, the DOE Office of River Protection (ORP) entered into a comment resolution process with Ecology staff to address on all of the analyses and related document. This process involved well over 100 individual meetings with Ecology staff that continued until August 2020. ORP provided a response to each comment provided by Ecology and was able to reach agreement on a large majority of comments. ORP worked closely and in good faith with Ecology to reach agreements on some key technical issues that were resolved with documented Interagency Management Integration Team (IAMIT) determinations.

The resolution of Ecology's comments resulted in some changes to RPP-RPT-58329, Rev. 3 that are summarized in the following Table J-1, a crosswalk showing report organization changes between Rev. 2 and Rev. 3 of RPP-RPT-58329. The changes included the elimination of Appendix F (highlighted in red in Table J-1 below), the addition of new subsections within Section 3, and the addition of four new Appendices (highlighted in **bold** in Table J-1 below).

The review comment record provided in this Appendix (Table J-2) also includes comments received from Ecology in their review of new draft material provided in Section 3 and Appendices F, G, and H of RPP-RPT-58329, Rev. 3.

Table J-1. Crosswalk of Report Organization Changes between Revisions 2 and 3 of RPP-RPT-58329 Resulting from Ecology's Review of this Documentation. (2 sheets)

RPP-RPT-58329, Rev. 2		RPP-RPT-58329 Rev. 3	
Section or Appendix	**Titles**	**Section or Appendix**	**Titles**
1	Introduction		Preface
2	Data Collection and Evaluation	1	Introduction
3	Human Health Risk Assessment	2	Data Collection and Evaluation
4	Screening Level Ecological Risk Assessment	3	Human Health Risk Assessment
5	Summary and Conclusions	4	Screening Level Ecological Risk Assessment
6	References	5	Summary and Conclusions
Appendix A	Assigned Values for Exposure Parameters	6	References
Appendix B	Toxicological and Physical Properties for Nonradiological and Radiological COPCs	Appendix A	Assigned Values for Exposure Parameters
Appendix C	Intake and Risk Assessment Summary Report for Nonradiological COPCs	Appendix B	Toxicological and Physical Properties for Nonradiological and Radiological COPCs
Appendix D	Radiological Risk Assessment Calculations and Summary Reports	Appendix C	Toxicological and Physical Properties for Each COPC
Appendix E	Results of SLERA	Appendix D	Radiological Risk Assessment Calculations and Summary Reports
Appendix F	Evaluation of Lindane and Beta-BHC Analytes at the Waste Management Area C (WMA C) for Baseline Risk Assessment Analysis	Appendix E	Results of SLERA
Appendix G	WMA C EPC Differences Between Using ProUCL V4.00.05 and ProUCL V5.1	**Appendix F**	**Direct Exposure Radiological Risk Evaluations Using Sample-By-Sample Approach**
		Appendix G	**Direct Contact Nonradiological Risk and Hazard Evaluations Using Sample-By-Sample Approach**
		Appendix H	**Protection of Groundwater Assessment Using Sample-By-Sample Approach**
		Appendix I	WMA C EPC Differences Between Using ProUCL V4.00.05 and ProUCL V5.1

Table J-1. Crosswalk of Report Organization Changes between Revisions 2 and 3 of RPP-RPT-58329 Resulting from Ecology's Review of this Documentation. (2 sheets)

RPP-RPT-58329, Rev. 2		RPP-RPT-58329 Rev. 3	
Section or Appendix	**Titles**	**Section or Appendix**	**Titles**
		Appendix J	**Review Comment Record - RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2.**

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 1 of 27)

TOC - REVIEW COMMENT RECORD (RCR)	1. Date: 08/26/2020	2. Review No.:
	3. Project No.:	Page 1 of 1

5. Document Number(s)/Title(s):	6. Program/Project/Building Number:	7. Reviewer:	8. Organization/Group:	9. Location/Phone:
RPP-RPT-58329, Rev. 2 - ARisk Assessment of Contaminanted Solis and Vadose Zone Sediments at Waste Management C, Hanford Site, Washington	Waste Management Area C HFFACO Appendix I Performance Assessment	Lead Reviewer - Elizabeth Rochette	Washington State Department of Ecology	Richland, WA (509)372-7922

10. Agreement with Indicated Comment Disposition(s):

Reviewer/Point of Contact:		Author/Originator:	
Print First and Last Name		*Print First and Last Name*	
Signature	*Date*	*Signature*	*Date*

11. CLOSED:

Reviewer/Point of Contact:		Author/Originator:	
Print First and Last Name		*Print First and Last Name*	
Signature	*Date*	*Signature*	*Date*

17. Comment Submittal Approval::

Organization Manager *(Optional)*:

Print First and Last Name	*Signature*	*Date*

12. Item	13a. Comments	13b. Basis/Category	13c. Recommendation	14. Reviewer Concurrence		15. Disposition *(provide justification if **NOT** accepted)*	16. Status	+
				Yes	No			
				○	○			X

A-6005-747 (REV 4)

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 2 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRAG-1	General	General	General	Ecology completed our review of the WMA C BRA and submitted our comments to USDOE on July 14, 2017. The document was a component of the Appendix I Performance Assessment for WMA C. However, there was a significant omission from this document that became evident during our review of the Waste Management Area C Phase 2 Corrective Measures Study Report (RPP-RPT-59379, Rev. 0), which we would like corrected. Risk and hazard values were not reported in the WMA C BRA, as given in the WMA C CMS, for three significant unplanned releases and the 216-C-8 French drain. While Ecology focused our review on the Phase 2 sample locations discussed in the WMA C BRA document, we emphasize that two of these three UPRs (UPR-200-E-82 and UPR-200-E-86), and releases to the 216-C-8 French drain (estimated to be lower risk than UPRs 200-E-81, -82, and -86) were entirely omitted from the WMA C BRA.	UPR-200-E-81 (Area P) – a pipeline release of Plutonium Uranium Extraction (PUREX) cladding waste from 1961, near 241-CR-151, from a PUREX plant pipe that connected to tank C-102 is thought to account for roughly 49% of the chemical inventory released at WMA C (RPP-RPT-59379, Rev. 0). The WMA C CMS report currently estimates baseline radiological cancer risk associated with this release at 1, (i.e. exposure of an industrial worker to this release, using the CMS scenario, would have a 100 % probability of developing cancer). UPR-200-E-82 – a high-Cs-137 pipeline leak of PUREX high-level waste supernatant that was covered by shotcrete years after the release. The WMA C CMS report currently estimates the baseline radiological cancer risk associated with this release at 200; exposure of an industrial worker to soil beneath the shotcrete, using the CMS scenario, would have a cancer probability of well above 100 %. UPR-200-E-86 – a large-volume pipeline leak of PUREX sludge supernatant that was eventually covered by shotcrete. The WMA C CMS report currently estimates the baseline radiological cancer risk associated with this release at 80; exposure of an industrial worker to soil beneath the shotcrete from this release, using the CMS scenario, would also have a cancer probability of well above 100%.	Considering the extremely large radiological cancer risks estimated for these releases under baseline conditions, Ecology expects the risk information about these releases, such as that contained in Appendix B of the WMA C CMS report (RPP-RPT-59379, Rev. 0), to be included in the WMA C BRA. Please include summary statements in the Executive Summary and body of the document, giving the estimated risk associated with these releases. We also ask that the radiological risks be reported as doses as well as cancer risk in the WMA C BRA.	Section 3.3 of RPP-RPT-58329, Rev.2 summarized three supplemental risk assessments - (1) Supplemental Human Health Risk Assessment for Exposure Areas; (2) Supplemental Human Health Risk Assessment for Unplanned Releases; and (3) Supplemental Human Health Risk Assessment for Past Leaks, Surface Releases and French Drain. Those assessments were performed to support the CMS alternatives evaluation and documented in Waste Management Area C Phase 2 Corrective Measures Study Report (RPP-RPT-59379). Due to presence of high levels of radiological contamination and safety concerns, no samples were collected, and risk assessments were not performed at these locations as part of the RFI. The supplemental risk assessments presented the results of risks and hazards under current and assumed post-remediation conditions and concluded that both risks and hazards under assumed post-remediation condition are within acceptable levels for risk and hazard. It should be noted that Ecology reviewed and approved those supplemental risk assessments as well as the preferred alternative selected within the document, RPP-RPT-59379. Executive Summary of RPP-RPT-58329, Rev. 2 did not include any information regarding those three supplemental risk assessments. Risk assessment information for the supplemental risk assessments have been included in the Executive Summary.
BRAG-2	General	General	General	The WMA C BRA was not updated for consistency with the updated values in RPP-ENV-58813, Exposure Scenarios for Risk and Performance Assessments in Tank Farms at the Hanford Site, Washington. However, the WMA C BRA, Rev. 02 was released in October, 2016, while RPP-ENV-58813 had been released in February, 2016.	—	To address this issue, Ecology requests a meeting to discuss the nature of the exposure scenario changes, revision of the WMA C BRA to incorporate appropriate changes, and addition of RPP-ENV-58813 to the Hanford Administrative Record.	The current version of WMA C BRA was prepared to address Ecology's comments made on WMA C BRA, Rev. 0 report that was released in November of 2014. The exposure scenarios representing both unrestricted and reasonably anticipated future land uses for WMA C were outlined in RPP-RPT-47479, Exposure Scenarios for the Waste Management Area C Performance Assessment (January 2011) and were considered for the WMA C BRA. The exposure assumptions related to WAC receptor scenarios within WMA C BRA are consistent with WAC 173-303. It should be noted that the current version of RPP-ENV-58813 (Rev. 1) was updated and added to the Administrative Record during 2019. Therefore, WMA C BRA have not been updated using the exposure assumptions included within RPP-ENV-58813 (Rev. 1). DOE is providing a table to show the exposure assumptions for each receptor scenario, along with a summary of the updated values and their potential impacts on risk calculations and conclusions. DOE presented this table to Ecology during July 14, 2020 and discussed those exposure assumptions and their potential impacts on risk calculations as part of our discussion series.
BRAES-1	ES	ii	27-46	The SMDP process is from CERCLA guidance but the primary regulator for this unit (Ecology) was not involved in the SMDP process. Therefore, Ecology does not acknowledge this process for satisfying WAC 173-303 requirements.	WAC 173-303-610(b)(i) requires cleanup levels based on WAC 173-340-700-760, excluding -745. These sections of the regulation do not include an SMDP process for screening contaminants or sites.	Maintain contaminants and locations in the risk assessment and into remedial investigations and corrective measure studies when contaminants have exceeded the requirements in WAC 173-340-700 - 760, excluding -745.	Even though there is extensive precedent in Hanford risk assessments for applying SMDP (e.g., River Corridor OU BRAs, 300 Area, 100-D/H, and 100-N), no SMDP has been implemented for WMA C BRA. Therefore, based on results of Tier 1 and Tier 2 SLERA, several radiological (Cs-137, H-3 and Sr-90) and nonradiological COPECs (Boron, molybdenum, selenium, thallium, sulfate and 6. Bis (2-ethylhexyl) phthalate) have been retained as COPECs for various EAs within WMA C. Text within the report has been updated to reflect such changes.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 3 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRAES-2	ES	iii	12-16	Because the soil EPC for Cd (1 mg/kg) exceeds both the Hanford 90th percentile soil background (0.56 mg/kg) and the MTCA three phase model soil CUL (0.69 mg/kg), Cd should be retained as a soil COPC.	Soil Cd exceeds both Hanford background (90th percentile) and the soil CUL for groundwater protection (MTCA 3 phase model).	Retain Cd as a soil COPC.	Closed per IAMIT Determination 2019-007. Additionally, cadmium was retained as soil COPC for EA C and EA R within RPP-RPT-58329, Rev.2. No changes have been made.
BRAES-3	ES	iii	23-26	Clarify if the compliance is required for 1000 or 10000 years.	Compliance times should be specified.	Clarify if the compliance is required for 1000 or 10000 years.	There is no EPA guidance related to period of compliance for radiological risk assessment. However, EPA's PRG Calculator and Dose Compliance Calculator utilize a period of 1,000 years.
BRAES-4	ES	iii	33	Se-79, Sn-126, U-238, and total U are listed here, but the follow-up text does not address these contaminants. Please address.	All detected contaminants should be addressed.	Describe STOMP groundwater results for Se-79, Sn-126, U-238, and total U, relative to DWS levels.	Closed per IAMIT Determination 2019-007. Additionally, all information related to the STOMP groundwater results for Se-79, Sn-126, U-238, and total U relative to DWS levels were deleted within RPP-RPT-58329, Rev. 2. No changes have been made.
BRAES-5	ES	iv	23-36	The text, cited in Ecology Letter 16-NWP-130, may apply to the 200-SW-2 Radioactive Landfills Group OU, but it does not apply universally.	In an email (10/26/2016) with Dr. Anita Singh (Lockheed Martin Environmental Services, lead statistician for ProUCL development), she indicated that the UCL is the best statistic to estimate EPC and should be used irrespective of its value (> or < maximum). In another email (10/28/2015) on this subject, Dr. Scott Ferson (formerly with Applied Biomathematics who currently holds the Chair of Uncertainty at the Inst. for Risk and Uncertainty, School of Engineering, Univ. of Liverpool) commented on an EPA publication (1992, Pub. 9285.7-081) which allowed use of the sample max when the UCL exceeds the max (note that EPA [1992] was subsequently updated by EPA [2002, OSWER 9285.6-10]). Dr. Ferson states the following, "EPA [1992] guidance says one can use the sample max as the EPC when it is smaller than the 95% UCL. From a statistical perspective, this seems like a completely unwarranted idea to me, and I've never understood any justification for it other than as a naked concession to PRPs. As a matter of policy, it also seems to me to be a bad idea because it can disincentivize PRPs from making more measurements. I think we should be encouraging more sampling when uncertainties are large."	Alternatively and more statistically sound, the highest 95% UCL, "suggested" by ProUCL output, should be used as the EPC. In cases where a 95% UCL cannot be calculated or is not suggested by ProUCL, EPC may default to the sample maximum. <u>The maximum should not be used, simply because a 95% UCL exceeds the maximum</u>. EPA has previously stated, "It is important to note, however, that defaulting to the maximum observed concentration may not be protective when sample sizes are very small because the observed maximum may be smaller than the population mean" (OSWER 9285.6-10). Whenever possible, Ecology prefers collection and evaluation of larger data sets (n>10 samples). Finally, in terms of confidence level, 95% UCLs are recommended in order to avoid unreasonably low EPCs (e.g., 90% UCL) or high EPCs (e.g., 99% UCL).	Text within Ecology's letter 16-NWP-130 was included to address Ecology's concern related to the methodology utilized during the calculation of EPC for statistical sampling approach using ProUCL 4.1. However, the text was deleted from the executive summary. It should be noted, the following text has been added within the Executive Summary to support the application based on sample-by-sample approach for judgmental sampling and the supplemental risk assessments that were performed as a part of the RCRA CMS Report for WMA C (RPP-RPT-59379): "Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for the COPCs. However, due to the presence of extensive amounts of interferences caused by buried infrastructure and topographic constraints, a sample-by-sample approach was used to calculate the source-term concentration. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the Interagency Management Integration Team (IAMIT) Determination 2019-006, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Judgmental Sample Analysis*, an additional HHRA was performed for four exposure scenarios and the groundwater protection evaluation using a sample-by-sample approach. In addition, three supplemental RAs were conducted to support the Corrective Measures Study alternatives evaluation process as documented in RPP-RPT-59397, *Waste Management Area C Phase 2 Corrective Measures Study Report*." Additional text has been added within the Executive Summary to summarize the results of the HHRA based on sample-by-sample evaluation and the results of three supplemental risk assessments.
BRA1-1	1.2	1-3	39	Text states the BRA is based on complete exposure pathways. While this is true, the groundwater pathway does not include current contamination, so only a subset of the total sources of contamination are considered.	—	Clarify that even though all pathways are considered, the groundwater pathway does not include current contamination.	Closed per IAMIT Determination 2019-007. No changes have been made.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 4 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA2-1	2.1	2-1	general comment	What constitutes the set of soil characterization data is not clear.	—	Indicate in the text that at each of the sampling locations, there are several samples from a variety of depths, and indicate the range of the number of samples and depths at the locations. For example, you could say something like "Each sample location has between n1 and n2 samples, that range in depth from d1 to d2", and you would put in the correct values for n1, n2, d1, and d2.	Table 2-2 has been added at the end of Section 2 to provide a summary of the characterization data. It should be noted that several samples were collected at various depths from each sampling location with each EA. Therefore, Table 2-2 includes information related to EA, Sampling location, Sample IDs and Depths. Sampling results are not included in the table.
BRA2-2	2.1	2-1	14-15	Sampling at judgement sampling locations consitutes biased sampling, and the results no longer are random samples that represent the true population of samples. This has implications for the legitimacy of making inferences to the wider population (representativeness) with inferential statistics (e.g., use of a 95% UCL to estimate a population mean). The use of these data in statistical analysis, such as calculating averages or upper confidence limits, is suspect and discouraged. Ecology will rely most on individual sample results.	For example, sample locations are chosen subjectively, such that all locations in the population do not have an equal and independent chance of being selected, as contrasted with simple random sampling (or probability sampling). Therefore, inferences to the wider population cannot be made with judgment sampling, and conclusions are limited to the sample data.	Describe the basis, pros, and cons of the sampling design. Compare individual sample results against the pertinent thresholds. Highlight exceedences and carry the contaminants and their locations forward into the planning of remedial actions.	The following text has been added in 1st paragraph of Page 3-2 to address issues related to the RFI work plan and judgmental samples: "Two types of HHRAs were conducted for contaminants present in the soil and vadose sediment within WMA C. Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for contaminants. However, due to the presence of extensive amount of interferences caused by buried infrastructure and topographic constraints, a judgmental sampling approach was applied. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA were performed for five risk scenarios using a sample-by-sample evaluation. In addition, three supplemental RAs were conducted to support the CMS alternatives evaluation process as documented in RPP-RPT-59379, *Waste Management Area C Phase 2 Corrective Measures Study Report*."
BRA2-3	2.2	2-1	41 - 42	Text states that all sample results flagged with a 'U' are considered non-detected, but the text does not explain what this means in terms of how the data are used or not used in the analysis. Furthermore, a 'U' qualifier is somewhat meaningless in the absense of a detection limit.	—	Briefly explain here how non-detect data are used, and briefly describe the basis for detection limits (for example, are they based on some human health criterion?) and provide a reference where the contaminant specific detection limits can be found.	Section 3.1.2.6 of the BRA provided a brief summary of how ProUCL software utilizes both detect and non-detect sample results during the calculation of 95%UCL. More detailed explanation related to the handling of non-detect results during the UCL calculation is provided in Chapter 4 of ProUCL version 5.0.00 User's Guide. For WMA C BRA, the non-detect sample results for nonradiological contaminants were used directly within the ProUCL software as non-detected values at the specified detection limit. For radiological contaminants, reporting results for both non-detect and detected sample results were used by the ProUCL software during the calculation of 95%UCL. No substitution was used for radiological sample results. In addition to sample results, the analyte-specific detected and non-detect sample results were also designated as 1 and 0, respectively, to represent the detection status for each sample result within the ProUCL input files. Information related to the non-detect and detected sample results for nonradiological and radiological contaminants has been included in Section 3.1.2.6.
BRA2-4	2.3.2	2-4	21 - 26	The handling of non-detect data in the evaluation of field duplicate results is potentially problematic.	—	Even though a result may be considered not-detected, the result typically has a reported numeric value, and that value is the best estimate of the actual concentration, and that value should be used in any analyses or data reduction. For example, in the case where there is at least one detection and one or more nondetected results, it could be that one of the nondetected results is greater than the maximum detected value. This is common for cases where concentrations are very low and near a generic detection limit, as the sample specific detection limit can widely vary. This reviewer would recommend simply using reported values, independent of the detection status (at least if actual values are reported). All the criteria could simply be reduced to stating that the maximum reported concentration is used.	Concur. The following text has been added at the end of Section 2.3.2: "Nondetect samples were analyzed for but not detected above limiting criteria. Limiting criteria may be any of the following: value reported < 0; value reported < counting error; value reported < total analytical error; value reported ≤ contract MDA. The reporting results associated with nondetect samples have greater uncertainties as compared to the sample results associated with detected samples. Further, samples are sometimes diluted for certain measurements to be made which results in nondetection for some contaminants. In general, detected sample results were given higher preference when both detect and nondetect results were available for the same sample. When only nondetect results were available for a sample, the result with lowest detection limit was used in the analysis."

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 5 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA2-5	2.4	2-4	31-32	Explain why the "13 judgment sampling locations within WMA C are grouped into 10 primary exposure areas (EAs)." From Appendix N in the RFI [RPP-RPT-58339, Rev 0], it appears that either one or two geographic locations was sampled (over multiple depths) at each EA. This implies that risk metrics (cancer risk, noncancer HQ, rad SOF) were calculated from only one or two locations per EA which is marginal at best for acceptable risk characterization. Clarify if this is the case.	Location and size of EAs, number of samples at depth per EA, and sampling design (within and across EAs) should be fully described and have a clear basis.	Describe the soil sampling design for WMA C overall, as well as within each EA. For example, specify the number of geographic sample locations in each EA, as well as the number of samples collected at depth in each EA (i.e., shallow and deep), and explain how sample depths were selected within each EA (e.g., random, biased) in this BRA. Also, provide rationale for the grouping of 10 EAs and how this may impact calculation of risk.	The following text has been added at the end of Section 2.1 (page 2-2). “Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA were performed using a sample-by-sample evaluation.”
BRA3-1	3.1.1; 4.2	3-3; 4-5	32 - 37; 27-30	Eliminating a radionuclide based only on its half life being less than 3 years is not necessarily valid. Even though after 30 years its concentration will be reduced by a factor of one thousand, if the original concentration was very high, in principle there still may be significant concentration remaining. In addition, if there are a large number of such radionculides, even small individual concentrations may leed to a total risk contribution from the sum of all such radionuclides that may be significant. What really matters is the summ of all radionuclides' current contribution to risk.	—	For the 27 radionuclides with half lives less than 3 years that were eliminated as COPCs, provide some context as to their total contribution to risk.	The first paragraph of Section 1.2 has been modified to reflect that this risk assessment focuses on contaminated soil in the vadose zone. Resolved through IAMIT Determination 2019-007.
BRA3-2	3.1.1	3-3	39-43	Text describes one COPC exclusion criteria as, “Analytes without Known Toxicity Information.” A recent editorial in Toxicol Sci notes, “Surprisingly, the current model deems that if we have no reliable toxicity data for a given chemical then it must be assumed to be safe. Although we may be blissfully ignorant of the toxicity this could indeed be very dangerous for the health of the human race and for the planet” (Miller, 2015--A link to this reference is in the next column).	http://toxsci.oxfordjournals.org/content/early/2015/02/25/toxsci.kfu310.full.pdf	Describe the potentially nonconservative uncertainty associated with this exclusion.	Ecology accepted DOE’s response for this comment during the first review. Based on the comment, the following text was added: “Human health risk assessment was performed for radionuclides, metals, VOC, SVOCs/PAHs and pesticides/herbicides. Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 11 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes, and were used when they were detected during radiological risk assessment. Among 2 VOCs, one has not been detected and the other, (m+p)-Xylene, was detected in one sample out of 47 samples with a very low concentration (less than 1% of the screening values for the surrogate compounds). None of the SVOCs and pesticides were detected. Because of the lack of detection, those analytes will not contribute to the total risks.”
BRA3-3	3.1.2	3-4	13-15	Text states, "Sampling results for 37 primary and secondary contaminants were reported as not detected at MDLs exceeding required detection limits listed in RPP-PLAN-38777." This statement is not clear. Does it imply that there are cases where the sample specific MDL was greater than the required detection limit? If this is the case, then there is a problem in that the analysis did not meet the detection limit. When MDLs are greater than "required detection limits," this creates an uncertainty, assuming required detection limits correspond to some regulatory criteria. In this case, MDLs are not sufficiently sensitive to evaluate regulatory criteria.	MDLs need to be below required detection limits (exhibit sufficient sensitivity) to adequately evaluate regulatory criteria.	Discuss the uncertainty generated when MDLs exceed regulatory criteria.	The following text has been added after that sentence (Line 15). The paragraph has been included in the uncertainty analysis (Section 3.4.1). “Sampling results for 37 primary and secondary COPCs were reported as not detected at MDLs exceeding target detection limits. The required and target detection limits were, in most instances, risk-based or statistically derived. Some exceedances were attributable to result calculation based on aliquot size used for preparation and analysis. Other exceedances were attributable to sample dilutions needed to alleviate interference from other analytes in the sample (high concentrations, overlapping peaks, etc.) or the sample matrix. A number of exceedances were attributable to the variability in MDLs across laboratories. These exceedances resulted in an uncertainty to the risk calculation.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 6 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-4	3.1.2	3-4	17-20	Text states that 110 analytes were not detected (after removing excluded analytes), but the subsequent chemical group listing of non-detects (in the following sentence) sums to 109 analytes.	Internal consistency is needed.	Please reconcile the number of non-detects in the text.	Concur. The text is correct. One anion is missing in that list. The following text has been revised as follows: “Non-detected analytes in WMA C soil data included 1 anion, 1 metal, 5 polychlorinated biphenyl aroclors, 15 pesticides, 6 radionuclides, 32 SVOCs, and 50 VOCs.”
BRA3-5	3.1.2	3-4 - 3-6	Table 3-1	Some contaminants (though concentrations may be low) are missing from the table: Area A+B: Ni-63, Tc-99, tritium, U-236; Area F+G:Tc-99; Area J: Am-241, Sn-126; Area L1+L2: Tc-99; Area P: C-14, Eu-154, Eu-155; Area R: thallium (HQ > 1 and exceeds ecological threshold 0f 0.5 mg/kg for invertebrates from DOE/RL-2010-96, Rev. 0); Area U: Tc-99.	The data set: WMA C_SoilData_for_BRA_02June14_wGroupingsPu241, which was provided to Ecology separately from these documents, shows that these contaminants were detected at the locations given in the comment.	Please add these to Table 3-1 and include them in the risk calculations.	The following text has been added at the beginning of Section 3.1.1. “Shallow zone (0 to 15 ft bgs) soil samples data collected from 14 sampling locations within WMA C were utilized during the human health risk assessment (Section 3) and screening level ecological risk assessment (Section 4) to meet the requirements of direct contact exposure pathway as stated in WAC 173-340-740. It should be noted that soil samples were also collected from deep vadose zone (>15 ft bgs). Soil samples collected from both shallow and deep vadose zones were utilized for performing an assessment referred to as the “protection of groundwater pathway” to understand the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer (Subsection 3.1.6).” The Title of Table 3-1 has been updated as “Identification of Contaminants of Potential Concerns Based on Direct Contact Pathway for Each Exposure Area.” The table identified COPCs based on shallow zone soil sample data collected from 14 sampling locations. The Tile for Table 3-2 has been updated as “Exposure Point Concentrations for Nonradiological and Radiological Contaminants of Potential Concern Based on Direct Contact Exposure Pathways at Each Exposure Area.”
BRA3-6	3.2.1	3-8	Figure 3-1	Figure 3-1 should be labelled, "Human Conceptual site Model for WMA C." A footnote should be provided which explains how complete pathways that are not evaluated (represented with vertical bars, e.g., fish consumption for the WAC and CERCLA resident) are addressed (e.g., with rationale added in new text or reference to specific existing text).	Rationale needs to be provided for exposure pathways that are complete but not evaluated.	Please modify the title of Figure 3-1 (add "human" descriptor), and add explanation to support those pathways that are complete but not evaluated.	The following text changes have been made in Section 3.1.2.5. The following text has been added at the end of 5th paragraph: “Dermal contact of chemicals was evaluated for CERCLA and Native American receptor scenarios. Due to absence of petroleum products, the dermal contact pathway may be complete, but not evaluated for WAC receptor scenarios.” The following text has been added at the end of 10th paragraph: “Even though consumption of irrigated crops may be completed for WAC receptors, CERCLA residential and Native American scenarios, these will not be evaluated in this RA.” per IAMIT Determination 2019-008. The last sentence of the 1st paragraph within Page 3-13 has been revised as follows: “Even though surface water and sediment pathways may be complete for WAC receptors, CERCLA residential and Native American scenarios, these will not be evaluated in this RA.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 7 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-7	3.2.1	3-8	Figure 3-1	This figure shows that contamination from the five Sources Of Contamination infiltrate and percolate into groundwater, and subsequently that groundwater is then considered an Exposure Route and is evaluated as a Complete Exposure Pathway for several of the Receptor Scenarios, for example, ingestion of groundwater. If any of the receptor scenarios that evaluate ingestion of groundwater were to actually happen, it would not be possible for the receptor to filter out the component from current contamination in groundwater. I realize the stated purpose of the BRA is to evaluate remedial action alternatives for the five sources of contamination listed in Section 3.2.1.1 and in Figure 3-1, but the receptor scenarios that evaluate ingestion and use of groundwater are not realistic, as they do not evaluate the true groundwater concentrations, and this causes a conceptual problem.	—	Provide an explanation as to why a baseline risk assessment for WMA C does not include ALL sources of contamination. I understand that current groundwater contamination is addressed in another project or document, but then it ends up there are no documents that provide a total risk assessment for WMA C, and evaluation of remedial action alternatives is not based on knowledge of total risk, but rather is in the context of only a subset of contaminant sources at the site.	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-8	3.2.1.1	3-7	general comment	The list of five sources of contamination in WMA C leaves out what is perhaps the most significant source of contamination from a risk perspective, which is the groundwater. Intuitively, the term Baseline Risk Assessment implies a complete risk assessment, not one that is fragmented.	—	Specify that current groundwater contamination is a significant source of contamination at WMA C, but it is not included in this analysis. Provide explanation as to why there is a fragmented approach to reporting risk at WMA C. Explain what document will report on total risk from this WMA.	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-9	3.2.1.4	3-11 - 3-15	General	The soil adherence factors for different scenarios differ slightly and come from different references. While the differences are subtle, the reasoning for these differences is not given, so the variations seem arbitrary. Also, the soil adherence factor and the skin surface area are not given for the CERCLA construction worker.	For instance, the industrial worker has a skin adherence value of 0.12 mg/cm^2; the maintenance/ surveillance worker 0.1 mg/cm^2; the adult resident 0.07 mg/cm^2.	Instead of giving the scenario parameters in the text, consider preparing a table and including a column in the table that gives a brief explanation of the basis for parameter values.	The assigned values and the regulatory guidance document sources associated with the soil adherence factors for CERCLA receptor scenarios are presented in Section 3.1.2.5. Section 4.1 and Table 3-1 of ECF-HANFORD-14-0056, ECF-HANFORD-14-0058, ECF-HANFORD-14-0061, ECF-HANFORD-14-0062, ECF-HANFORD-14-0064, ECF-HANFORD-14-0066, and ECF-HANFORD-14-0067 provided the basis for adherence factors related to CERLCA Industrial Worker, CERCLA Maintenance/Surveillance Worker, CERCLA Adult Trespasser, CERCLA Youth Trespasser, CERCLA Construction Worker, CERCLA Residential Adult Receptor and CERCLA Residential Child Receptor, respectively. No changes have been made.
BRA3-10	3.2.1.4	3-11	10, 11	Text states the scope of this document is to evaluate existing contamination within WMA C and in groundwater up to 100 m downgradient. Yet line 26 on page 1-1 (Section 1.1) states that 'no groundwater evaluation was performed for the WMA C'. These two statements are not consistent.	—	Clarify statement.	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-11	3.2.1.4	3-12	19-21	Re potential Columbia River impacts, text states, "The impacts of waste left within WMA C on these surface water bodies will be evaluated through the use of a regional fate and transport model." More detail is needed on this model, including where this information will be presented.	Models need to be described and documented.	Provide details on the "regional fate and transport model" to be used to assess impacts to the Columbia River.	Closed per IAMIT Determination 2019-007. The following text has replaced two sentences (from Lines 8 to 10) within Page 3-13: "DOE/RL-2018-69, Cumulative Impact Evaluation Technical Approach Document, Draft A, provides more detailed information regarding the regional fate and transport model for the CIE." The reference has been added in the Reference Section. DOE/RL-2018-69, 2019, *Cumulative Impact Evaluation Technical Approach Document*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 8 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-12	3.2.1.4	3-12	26-29	Text states, "Food chain pathways were evaluated for radiological COPCs. They were not evaluated for nonradiological COPCs as EPA does not provide intake equations or recommend performing food chain analyses for chemicals (EPA/540/1-89/002)." This is not true. EPA (RAGS) does recommend evaluating intake of chemicals in food (e.g., fish, produce, meat, dairy), and RAGS provides intake equations for chemicals in food (Exhibits 6-17 thru 6-19). Therefore, both rads and nonrads should be evaluated in food chain pathways. As noted in the Executive Summary, this issue (previously described in Rev 0 of the BRA) remains an area of disagreement between Ecology and USDOE.	A receptor is clearly exposed to both radionuclide and nonradionuclide COPCs in food. There is extensive precedent in Hanford risk assessments for evaluating both radionuclides and nonradionuclides via food exposure (e.g., HSRAM, CRCIA, WTP, RCBRA, Exposure Scenarios for Hanford Tank Waste PAs [HNF-SD-WM-TI-707]). The overall uncertainty in risk estimation of radionuclides and nonradionuclides should be approximately equal. In this regard, many radionuclides and nonradionuclides have toxicity factors (e.g., risk coefficients for radionuclides, slope factors and RfDs for nonradionuclides), and many exposure factors are independent of a radionuclide vs nonradionuclide grouping (e.g., food intake rates, wet to dry conversion factors, exposure duration). Transfer factors (e.g., soil to plant, plant to beef) are based on empirical data and can be modeled based on structural properties, independent of radionuclide vs nonradionuclide differences. For example, a nonradionuclide (e.g., Se-76) would have the same transfer factor as a corresponding radionuclide of the same element (e.g., Se-79). That is, all isotopes of an element are assigned the same transfer factor (e.g., RESRAD), since chemical reactivity (including transfer properties) is determined by electron configuration (in an atom's outermost valence shell), rather than nuclear composition.	Re food consumption, evaluate both rad and nonrad COPC exposure.	—
BRA3-13	3.2.1.4.2	3-13	31-32	Groundwater ingestion should also be evaluated for the industrial worker under MTCA Method C (WAC 173-340-720[5][b][iii]).	All complete exposure pathways should be evaluated for the industrial worker.	In addition to soil ingestion and inhalation of vapors and dust, add groundwater ingestion for the MTCA industrial worker (specified in WAC 173-340-720[5][b][iii]).	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-14	3.2.1.4.6	3-15	general comment	According to Figure 3-1, the exposure route of using groundwater to irrigate crops is not evaluated for residential and tribal scenarios, yet using groundwater for drinking water is evaluated. It is not intuitive that if a well exists to use groundwater as drinking water, that the same water would not be used to irrigate crops and provide water for livestock. It appears the exposure routes are not complete.	—	Provide explanation as to what water is used to irrigate crops and why groundwater is not used for this purpose, especially considering that groundwater is used for drinking water, which implies a well exists. Earlier, in Section 1.2, the text states that the BRA is based on a complete set of exposure pathways. If this is true, then groundwater should be used for irrigation of crops and water for livestock.	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-15	3.2.1.4.6	3-15	34-36	Exposure pathways for the CERCLA resident for food intake (produce, meat, milk) should include both rad and nonrad COPCs.	See Comment #11.	Re food consumption, evaluate both rad and nonrad COPC exposure for the CERCLA resident.	Closed per IAMIT Determination 2019-007.
BRA3-16	3.2.1.4.7	3-16	11-12	Groundwater ingestion should also be evaluated for the resident under MTCA Method B (WAC 173-340-720[4][b][iii]).	All complete exposure pathways should be evaluated for the resident.	In addition to soil ingestion and inhalation of vapors and dust, add groundwater ingestion for the MTCA resident (specified in WAC 173-340-720[4][b][iii]).	Closed per IAMIT Determination 2019-007. No changes have been made.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 9 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-17	3.2.2	3-16	general comment	Generally speaking, calculation of statistical quanties for a limited set of samples is intended to determine characteristics of the true population of samples. This process is typically valid when the samples represent random samples. However, in this case of this BRA, statistical (UCL) quantities are determined from a set of biased (judgement) samples.	—	See prior comment on Section 2.1 regarding judgemental sampling and the use of statistics.	Closed per IAMIT Determination 2019-006. The text from lines 15 to 26 of the 1st paragraph of Page 3-2 to address issues related to judgmental samples: "Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for contaminants. However, due to the presence of extensive amounts of interferences caused by buried infrastructure and topographic constraints, a judgmental sampling approach was applied. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA was performed for five risk scenarios using a sample-by-sample evaluation."
BRA3-18	3.2.2	—	general comment on EPCs	The validity of the sample sets upon which the EPCs are based, is suspect. From a radiological standpoint, the most significant contribution to risk for almost all of the exposure scenarios at almost all of the exposure areas (see Tables 3-3 thru 3-9) is from external gamma, which is a near-surface phenomena, i.e. contamination below approx. 2 feet has little impact on external exposure. Yet, most of the EAs have only one single sample location, and most of the samples at that location are at depths below which there will be an impact from external gamma. In a situation where it is known external gamma will be the significant contributor to risk, it is important to have information on the surface distribution of contamination throughout the EA. Yet, in this BRA, the contaminant information comes from a single location in which many of the samples come from depths that will have no impact on external exposure. Thus, the EPCs are in no way representative of the distribution of suface contamination, and their use in estimating exposure from external gamma is highly questionable. As a fictional example, if Cs-137 is detected at the surface, but is found at very low or non detect concentrations at depth, then the EPC for the entire soil column would be "lowered" by the results at depth, and thus the concentrations at the surface that influence external exposure would be lower than they should be.	—	This issue needs to be discussed, as I believe it has significant impacts on the results of the risk assessment.	Closed per IAMIT Determination 2019-006 Resolved through resolution of Appendix F.
BRA3-19	3.2.2	3-16 - 3-17	4-10	The document quotes OSWER 9285.6-10 regarding the EPC and exposure areas, "An exposure unit is the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure." To use this definition for this document there would need to be a reason for expecting that the exposure areas designated here actually represent areas throughout which a receptor would move and encounter an environmental medium for the duration of the exposure. It does not appear that the exposure areas designated represent human or ecological exposure units. Also, it appears in Table 3-2 that all depths may have been used when calculating the EPC. Furthermore, the samples taken from these areas were chosen judgmentally, and do not have a statistical basis. Therefore, using statistics that assume random sampling, such as 95 UCLs, is not appropriate. Pooling data for different depths and from more than one core is also difficult to defend given the non-statistical sample design.	Table 2-1 indicates that the exposure areas are actually characterization areas, sampled to characterize particular releases, rather than to represent exposure units for humans or ecological receptors.	Evaluate individual samples (unique sample numbers) by comparing results against thresholds (individual contaminant thresholds, total risk and hazard index thresholds). This includes evaluating each depth from each core against thresholds.	Closed per IAMIT Determination 2019-006 Resolved through resolution of Appendices G, F and H.
BRA3-19	3.2.2	3-16 - 3-17	4-10	The document quotes OSWER 9285.6-10 regarding the EPC and exposure areas, "An exposure unit is the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure." To use this definition for this document there would need to be a reason for expecting that the exposure areas designated here actually represent areas throughout which a receptor would move and encounter an environmental medium for the duration of the exposure. It does not appear that the exposure areas designated represent human or ecological exposure units. Also, it appears in Table 3-2 that all depths may have been used when calculating the EPC. Furthermore, the samples taken from these areas were chosen judgmentally, and do not have a statistical basis. Therefore, using statistics that assume random sampling, such as 95 UCLs, is not appropriate. Pooling data for different depths and from more than one core is also difficult to defend given the non-statistical sample design.	Table 2-1 indicates that the exposure areas are actually characterization areas, sampled to characterize particular releases, rather than to represent exposure units for humans or ecological receptors.	Evaluate individual samples (unique sample numbers) by comparing results against thresholds (individual contaminant thresholds, total risk and hazard index thresholds). This includes evaluating each depth from each core against thresholds.	Closed per IAMIT Determination 2019-006 Resolved through resolution of Appendices G, F and H.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 10 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-20	3.2.2	3-17	11	ProUCL 4.00.05 has been updated. Please use ProUCL 5.1 (May 2016).	https://www.epa.gov/land-research/proucl-software	The most recent version of ProUCL software (ver 5.1) should be used.	Ecology accepted DOE's response for this comment (BRA 18) during the first review. Based on the response, ProUCL version 5.1 was used to calculate the EPCs and the results were presented in in Appendix I of the BRA. In addition, a comparison between the EPCs calculated using versions 4.1 and 5.1 of the ProUCL software was provided in the uncertainty section (3.4.2) of the report.
BRA3-21	3.2.2	3-17	20 - 22	ProUCL is used on data sets with non-detect results. It is not clear how non-detect results are handled.	—	Provide an explanation as to how non-detect results are handled in the UCL calculations. Even if a laboratory considers a result not-detected, typically an actual value is reported (rads), and this value is the best estimate of the sample's true concentration, and the reported value should be used in statistical calculations. Use, for example, of a detection limit instead of a reported value results in un-necessarly biased statistical quantities. Reported values (rads) should be used in statistical calculations, regardless of detection status.	See response to the comment no. BRA2-3.
BRA3-22	3.2.2	3-17	28-39	The text, cited in Ecology Letter 16-NWP-130, may apply to the 200-SW-2 Radioactive Landfills Group OU, but does not apply universally.	In an email (10/26/2016) with Dr. Anita Singh (lead statistician for ProUCL development), she indicated that the UCL is the best statistic to estimate EPC and should be used irrrespective of its value (> or < maximum).	See comment for p. ES-iv.	See response to the comment no. BRAES-5.
BRA3-23	3.2.2	3-19, for example	Table 3-2	Isotopic uranium concentrations appear to be similar to background concentrations. Therefore, it appears that the BRA is calculating risk that includes a contribution from background.	—	Provide rationale for keeping isotopic uranium as COPCs when it appears the EPC concentrations are background. If they are indeed considered as background, then perhaps they should not be retained.	The following footnote has been added after Table 3-2. "Even though uranium concentrations for all EAs are less than its background concentration, as a conservative approach, it was retained as a COPC during the risk assessment."
BRA3-24	3.2.2; 3.5.11.1	3-18 - 3-19; 3-81 - 3-104	Table 3-2; Table 3-14	The table gives chromium, but doesn't specify the species. Ecology will assume that this is hexavalent chromium in the absence of speciation information.	Hexavalent chromium was extensively used at Hanford, and is significantly more toxic than chromium (III). Ecology has to err on behalf of protecting human health and the environment so we will assume the more toxic form of chromium in the absence of speciation information.	Add a footnote on chromium specifying that the form of chromium will be assumed to be chromium (VI).	Concur. The following footnote has been added for Table 3-2 and Table 3-14: "All chromium analytical results for the WMA C soil data sets were assumed to be in the form of hexavalent chromium."
BRA3-25	3.2.3.3	3-44	general comment	The text mentions radiological dose assessment and the EPA's FGR 11 and FGR 12. Yet, it appears that dose assessment is not discussed in this BRA. Only risk, not dose, is discussed. Further, FGRs 11 and 12 are for calculating dose. So, why is a dose assessment, and the use of FGRs 11 and 12 mentioned?	—	Clarify if any radiological dose assessments are actually carried out, and if results from FGRs 11 and 12 are actually used somewhere in this BRA.	Concur. No dose assessment was performed in this BRA. Hence, the last sentence of Section 3.2.3.3 has been deleted. Instead of dose coefficients, risk coefficients included in FGR 13 were used. Hence the following text has been added: "RESRAD version 6.5 utilizes Federal Guidance Report (FGR) No. 13, which includes the risk coefficient values for all radionuclides (EPA 2002). The risk coefficients derived in FGR No. 13 are based on methods and models that take into account the age- and gender-dependence of radionuclide intake, metabolism, dosimetry, radiogenic risk, and competing causes of death in estimating the cancer risk from low-level exposures to radionuclides in the environment. These risk coefficient slope factors are presented in units per pCi (internal pathways) or risk per year per pCi/g (external pathways)."

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 11 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-26	3.2.3.3	3-44	18-20	Clarify RESRAD calculation of dose from water independent (ground, inhalation, plant, meat, milk, soil) and water dependent (water, fish, plant, meat, milk) pathways (e.g., see Appendix Table D-6-1).	Models should be well described and transparent.	Briefly describe rationale underlying RESRAD calculation of dose from water independent (ground, inhalation, plant, meat, milk, soil) and water dependent (water, fish, plant, meat, milk) pathways (e.g., see Appendix Table D-6-1). Also, clarify why dose from water ingestion and radon inhalation appear to be excluded (e.g., pathways set to inactive in Appendix Table A-2-1). Re drinking water ingestion, explain how risk from this pathway will be incorporated into the BRA, given that Table A-2-1 indicates that drinking water will be "evaluated as part of GW OU" (another project/document). Therefore, risk from groundwater ingestion should be added to risk from other exposure pathways for receptors which ingest groundwater (e.g., resident). Re radon, please provide the reference, NRC (1994), because I was unable to retrieve this reference.	The following text has been added for clarification: "RESRAD model calculates risk from both water-independent and water dependent pathways. The water-independent pathways include external radiation, inhalation, ingestion of plants (water-independent component), soil, meat and milk. The water-dependent pathways include ingestion of water, fish, meat, milk and plants (from irrigation water-dependent component). The risks from both pathways are combined together to calculate the total risk." Risk due to ingestion of groundwater were performed as a part of site-wide and well-specific groundwater risk assessment in 200-BP-5 RI (DOE/RL-2009-127, Draft A) report as defined in the Work Plan. Therefore, it was not included in this BRA. On August 22, 1994 (59 FR 43200), the NRC published a proposed rule for comment in the Federal Register to amend 10 CFR part 20 of its regulations "Standards for Protection Against Radiation" to include radiological criteria for license termination. The NRC published its final rule in the Federal Register, Vol. 62, No. 139, Monday, July 21, 1997, Rules and Regulations (https://www.gpo.gov/fdsys/pkg/FR-1997-07-21/pdf/97-17752.pdf). According to this rule, the NRC noted that "radon would not be evaluated when developing release criteria due to: the ubiquitous nature of radon in the general environment, the large uncertainties in the models used to predict radon concentrations; and the inability to distinguish between naturally occurring radon and that which occurs due to licensed activities." Hence, radon pathway was not considered during the risk assessment.
BRA3-27	3.4.2	3-50	32	Text states that the area of contamination for each EA is greater than 2,000 m2. I suspect that what you mean is that the area of each EA is greater than 2,000 m2, and that contamination is assumed to be equally distributed throughout the entire EA (the acutal area of contamination is not known due to limited sampling.	—	Clarify statement. Also, why not just use the actual area of each EA? Is that information not know?	Text has been revised as follows: "The actual area of contamination for each contaminant is not known. However, sensitivity analyses performed using the RESRAD model showed that risk is not sensitive when the area is greater than 2,000 m^2. Therefore, the area for each EA was assumed to be 2,000 m^2."
BRA3-28	3.4.2	3-50	32-35	It is not clear why "risk is not sensitive when the area of contamination is greater than 2000 m^2."	A lack of sensitivity of risk to area of contamination implies uniform contamination throughout shallow soils (0-15 ft bgs) in WMA-C.	Please provide rationale as to why "risk is not sensitive when the area of contamination is greater than 2000 m^2." Please include this sensitivity analysis in an appendix to the BRA, and provide it to Ecology for review.	See response to the comment no. BRA3-27.
BRA3-29	3.4.2	3-50	37-43	Provide more detail on the risk to source ratio (RSR) method to calculate risk for radionuclides. For example, Appendix D (e.g., Table D-1-2, p D-3) provides RSR values (risk/[pCi/g]) for each radionuclide for ground, inhalation, and soil pathways. Please describe (in greater detail) ground, inhalation, and soil pathways, and note that RSRs differ from risk coefficients (e.g., risk/pCi for inhalation).	Methodology should be adequately described.	Provide more detail on RSR method to calculate radionuclide risk, as well as more detail on ground, inhalation, and soil exposure pathways.	As a part of the risk assessment, risks for all applicable exposure pathways were calculated initially based on unit concentration (1 pCi/g) over a period of 1,000 years. The risk-to-source ratio (risk per unit concentration) for each COPC was multiplied with its corresponding EPC to calculate the risk for individual radionuclide. The risk results for all radionuclides were summed to calculate the total risk. Hence, an explanation has been provided in the text to clarify this.
BRA3-30	3.5.7.2	3-67	7-8	Because this scenario is the CERCLA resident, refer to the CERCLA HI target, rather than the MTCA HI target (even though they are the same, i.e., HI=1). This misplaced reference to MTCA occurs in the evaluation of each EA for the CERCLA resident.	Scenarios, receptors, and regulatory limits should be internally consistent.	Refer to the CERCLA HI target for the CERCLA resident.	Concur. Text has been updated to make the suggested changes.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 12 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-31	3.5.7.2	3-67	13-25	Identification of major health effects of noncarcinogens for the purpose of segregating hazard index (HI) should follow EPA/RAGS guidance. RAGS does not limit information sources for health effects to the IRIS database. Other useful sources include PPRTV, RAIS, and ATSDR. In fact, RAGS specifically mentions ATSDR Toxicological Profiles as an information source for health effects, and recommends identifying major effects of each chemical, including those observed at higher doses than the critical effect (i.e., most sensitive endpoint).	Hazard quotients (HQs) for multiple chemicals are additive if these chemicals adversely impact the same target organ. HQ should be calculated with the specific toxicity factor (e.g., RfD, MRL) derived for the effect described by that toxicity factor.	When segregating HI, consult multiple sources to identify noncancer health effects (e.g., IRIS, PPRTV, RAIS, ATSDR). For example, ATSDR lists hematological effects for intermediate oral MRLs for both V and Co, while IRIS lists a dermal effect (as the critical effect) for a chronic oral RfD for V. Therefore, HQ for both V and Co are additive for hematological effects, independent of a dermal effect listed for V in IRIS.	The following text has been added at the end of Section 3.1.4.1.2. “It should be noted that the effect(s) and mechanism(s) of action for each chemical are obtained by using the hierarchy as stated in Section 3.1.3.4. If toxicity and mechanism information is available in IRIS, that other toxicity and mechanism information beyond IRIS will not be considered and evaluated.”
BRA3-32	3.5.9	3-75	40-42	Text states, "The risk characterization was performed for information purposes; consequently, no risk and hazard contributors are identified during the risk characterization." Given that ELCR and HI exceed CERCLA risk (1E-4) and HI (1) limits for many of the EAs for CTUIR residents (Table 3-12) and Yakama residents (Table 3-13), rationale should be provided on how this information may or may not influence remedial decisions. For example, radiological ELCR exceeds 1E-3 in some cases.	All relevant information (e.g., exposure scenarios) should be considered in remedial decision making.	Clarify how results of tribal scenarios (e.g., CTUIR, Yakama) are considered in remedial decisions.	Text has been changed to: “The risk characterization was performed for information purposes.” That is, text starting with “, consequently ....” has been deleted.
BRA3-33	3.5.9	3-76	Table 3-12	Under "Carcinogenic Risk-Radiological Contaminants of Potential Concern," "External Gamma" is listed twice. It looks like "Soil Ingestion" is missing.	All relevant exposure pathways should be included.	In Table 3-12 under "Carcinogenic Risk-Radiological COPCs," replace one of the "External Gamma" entries with "Soil Ingestion."	Concur. The risks associated with external gamma pathway has been replaced by the risks associated with soil ingestion pathway.
BRA3-34	3.5.11.1	3-77	1-4	Texts states, "……COPCs for which maximum detected concentrations were greater than their corresponding cleanup levels and background concentrations." Replace "maximum detected concentrations" with "EPC," because EPC is not always the max (Table 3-2 or Table 3-14).	EPC is typically a 95UCL, rather than always the max sample concentration.	Replace "maximum detected concentration" with "EPC," because EPC is not always the max (Table 3-2 or Table 3-14).	Concur. The “maximum detected concentration” have been replaced by “EPC”.
BRA3-35	3.5.11.1	3-78	17-19	Text states, ".....a background comparison was performed to compare the maximum detected concentration to the 90th percentile background concentration." Replace "maximum detected concentration" with "EPC," because EPC is not always the max (Table 3-2 or Table 3-14).	EPC is typically a 95UCL, rather than always the max sample concentration.	Replace "maximum detected concentration" with "EPC," because EPC is not always the max (Table 3-2 or Table 3-14).	Concur. The “maximum detected concentration” have been replaced by “EPC”.
BRA3-36	3.5.11.1	3-78	32-35	The text states "However, the site-wide EPC (1 mg/kg) is below maximum soil background concentration." There are two problems here. First of all, WAC 173-340-709(3)(c) gives Ecology's definition for background for lognormal distributions as the 90th percentile background concentration (or 4 times the true 50th percentile, whichever is larger). Ecology will do all comparisons with the WAC 173-340 definition for background concentration and will disregard comparisons against the maximum background concentration. Second, this appears to be the first mention of a 'site-wide EPC' in the body of the document. This term is not defined and is not meaningful from the perspective of receptors. Ecology will disregard comparisons against a 'site-wide EPC.'	See WAC 173-340-709(3) for the definition of background. Also see prior comments on Section 3.2.2.	Discontinue comparisons against maximum background concentrations, and discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	Resolved through IAMIT Determinations 2019-006 and 2019-007.
BRA3-37	3.5.11.1; 5.2	3-78; 5-2	24-35; 30-34	When comparing EPC to background concentration, MTCA prescribes the 90th percentile of background concentration for lognormal distributions (WAC 173-340-709[3][c]), not the maximum background concentration. This site-wide EPC for Cd (1 mg/kg) exceeds the MTCA soil CUL for protection of groundwater (0.69 mg/kg). On an EA basis, according to text and Table 3-14, soil EPCs for Cd at 2 EAs (2.9 mg/kg at E, 3.1 mg/kg at R) exceed the MTCA soil CUL for protection of groundwater (0.69 mg/kg), as well as Hanford soil background (0.56 mg/kg, ECF-HANFORD-11-0038, Rev 0). Therefore, soil Cd may adversely impact groundwater at EAs E and R, due to a leaching pathway.	MTCA prescribes the 90th percentile of background concentration (or 4 times the true 50th percentile, whichever is larger) for lognormal distributions (WAC 173-340-709[3][c]), not the maximum background concentration.	Delete language implying that the maximum background concentration is an acceptable limit for background concentration. State that the cadmium concentrations at areas E and R exceed the MTCA soil CUL for protection of groundwater (0.69 mg/kg), as well as Hanford soil background (0.56 mg/kg, ECF-HANFORD-11-0038, Rev 0).	Closed per IAMIT Determination 2019-007. See response to the comment no. BRAES-2.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 13 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-38	3.5.11.1	3-79	12-17	Clarify why the MTCA Method B screening level values for groundwater for lindane and beta-BHC are used to assess their aqueous concentrations above the water table (rather than in groundwater). Also, note that these results indicate that lindane and beta-BHC may adversely impact groundwater after 1000 years.	Modeling analysis should be transparent.	Clarify why the MTCA Method B screening level values for groundwater for lindane and beta-BHC are used to assess their aqueous concentrations above the water table (rather than in groundwater). Also, note that these results indicate that lindane and beta-BHC may adversely impact groundwater after 1000 years.	Closed per IAMIT Determination 2019-007. It should be noted that all information related to the STOMP groundwater results for lindane and beta-BHC were deleted within RPP-RPT-58329, Rev. 2. No changes have been made.
BRA3-39	3.5.11.1	3-81	Table 3-14	Please clarify if the total number of samples for a given analyte per EA differ in Table 3-2 vs. Table 3-14 is due to shallow samples (0-15 ft) vs. shallow plus deep samples (entire vadose zone), respectively. The distinction should be noted in text and tables.	Data tables should be fully described.	Please clarify why total number of samples for a given analyte per EA differ in Table 3-2 vs. Table 3-14. If this relates to shallow samples (0-15 ft) vs shallow plus deep samples (entire vadose zone), this should be noted in text and tables.	See response to the comment no. BRA3-5. The following text has been added after line 19 of page 3-77 (Section 3.1.6). “Soil samples collected from both shallow zone (0 to 15 ft bgs) and deep vadose zone (>15 ft bgs) were utilized to perform the assessment for protection of groundwater pathway.” The Title for Table 3-14 has been updated as “Results of Data Assessment for Protection of Groundwater Pathway Using Shallow and Deep Vadose Zone Soil Sample Results and Three-Phase Equilibrium Partitioning Model”.
BRA3-40	3.5.11.1	3-81 - 3-104	Table 3-14	The table gives the 3-phase model value chromium as 2,000,400 ug/kg. This is for chromium (III). The hexavalent chromium value is missing but is 200 ug/kg using a site-specific Kd value of 0 L/kg from PNNL-13895; therefore, the values of hexavalent chromium at sites A&B, C, E, F&G, H&I, J, L1&L2, P, R, and U exceed the 3-phase model value.	Ecology assumes that the species of chromium is hexavalent in the absence of speciation data.	Change the 9th column to 'yes' to indicate that the chromium concentrations exceed the WAC 173-340 3-phase model value.	Hexavalent chromium was not measured. Both the reported results and background concentration represent concentrations associated with total chromium. In response to Ecology’s comment, if the chromium reported as total chromium is assumed to be present only as hexavalent chromium, all sample results were compared against the soil concentration protective of groundwater (0.19 mg/kg) for hexavalent chromium. Appendix G and Section 3.2.3 of RPP-RPT-58329, Rev. 2 present the results of groundwater protection evaluation including hexavalent chromium. Please review responses to new comments no. BRA3-65 and BRA3-66 for updated text. No changes have been made in this section.
BRA3-41	3.5.11.1	3-81 - 3-104	Table 3-14	Thallium is missing from the table for site C. The maximum thallium value for site C was 304 ug/kg on 6/12/12 at a slant depth of 6.5 ft. It is also missing from site R where its maximum value was 1220 ug/kg on 5/11/2010 at a slant depth of 0.5 ft.	These values exceeds the soil value to protect groundwater (3-phase model) value in the CLARC database.	Add thallium for site C and enter 'yes'for column 9 in the table.	Resolved through IAMIT Determination 2019-006. It should be noted that all information related to fate and transport modeling performed as a part of the Past Leaks document were not included in RPP-RPT-58329, Rev. 2. Thallium is not identified as a soil COPC during the initial HHRA. No assessment of thallium was performed for the protection of groundwater evaluation. However, based on Ecology’s comments, sample results for thallium and hexavalent chromium are included during groundwater protection evaluation in RPP-RPT-58329, Rev. 2, and such comparison was presented in Appendix G. No changes have been made.
BRA3-42	3.5.11.2	3-109	Table 3-15	Re Table 3-15, it appears that units for peak concentration for Total Uranium should be µg/L for both the fenceline and 100 m downgradient (in order to be consistent with each other and with units in Figures 6-23 and 6-21 in RPP-RPT-59197, Rev 1).	Units should be correct.	Re Table 3-15, it appears that units for peak concentration for Total Uranium should be µg/L for both the fenceline and 100 m downgradient (in order to be consistent with each other and with units in Figures 6-23 and 6-21 in RPP-RPT-59197, Rev 1).	Resolved through IAMIT Determination 2019-007. As mentioned earlier, all information related to site-specific STOMP model results have been removed from the BRA. No changes have been made.
BRA3-43	3.6.1	3-110	26	UCLs are based on biased sampling.	—	Discuss the uncertainty introduced from using biased, rather than random, sampling when calculating statistical quantities.	An additional paragraph has been added at the end of Section 3.4.1 with the following text: “Initial HHRA was performed by utilizing the statistical analysis of the sample results to calculate the source-term concentrations for contaminants. However, due to the presence of extensive amount of interferences caused by buried infrastructure and topographic constraints, judgmental sampling approach was applied. Statistical analysis may not be the right approach to calculate the source-term concentrations for biased samples. Therefore, in accordance with the IAMIT Determination 2019-006, an additional HHRA was performed for five risk scenarios using a sample-by-sample evaluation.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 14 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-44	3.6.1	3-110	30-31	Text states, "A total of 136 soil samples were collected at various depths (near surface [0 to 3 ft bgs], shallow surface [0 to 15 ft bgs] and deep [>15 ft bgs]) from 10 EAs within WMA C." However, Table N-1 (Appendix N in RPP-RPT-58339, Rev 0) appears to show about 150 soil samples. Please clarify.	Related documents should present data consistently.	Text states, "A total of 136 soil samples were collected at various depths (near surface [0 to 3 ft bgs], shallow surface [0 to 15 ft bgs] and deep [>15 ft bgs]) from 10 EAs within WMA C." However, Table N-1 (Appendix N in RPP-RPT-58339, Rev 0) appears to show about 150 soil samples. Please clarify. Also, include Table N-1 (Appendix N in RPP-RPT-58339, Rev 0) in this document.	The following text has been added at the beginning of 2nd paragraph within Section 3.4.1. "Table N-1 of the WMA C RFI includes all primary and duplicate samples collected from various depths within each EA as a part of Phase 2 Site Characterization for WMA C. Among those, a total of 136 primary soil samples...."
BRA3-45	3.6.1	3-110	30 - 33	Text states that a sufficient number of samples where collected to adequately characterize the nature and extent of the contamination. This is clearly not true, as the extent of contamination cannot be characterized by information at a single sample location (most of the EAs).	—	Correct, or eliminate, this statement.	Text has been revised as follows: "A total of 136 soil samples, collected from various depths (near surface [0 to 3 ft bgs], shallow surface [0 to 15 ft bgs] and deep [>15 ft bgs]) within 10 EAs, were utilized to characterize the nature of the soil contamination for WMA C."
BRA3-46	3.6.1	3-110	33 - 40	Here it states that only shallow surface zone (0 to 15 ft bgs) results are used in the risk assessment. As stated in 'general comment on EPCs' from the comment on Section 3.2.2 above, contaminaton below approximately two feet will not contribute to external gamma exposure (the most significant contributor to radiological risk), and so use of data below a few feet may actually result in underestimating risk. Further, lines 37 - 40 result in an unclear description of the basis for the EPCs at each EA.	The reader cannot tell exactly what values were used in the UCL calculations, and the EPC values and their basis. When statements such as ".... was often selected as the EPC rather than ...." the reader is left not knowing the criteria for making such decisions.	Clarify. It would be beneficial for this BRA to contain a table, perhaps in an appendix, that shows the raw data from each location (see previous comment for p. 3-110, lines 30-31).	Concur with the initial comment. During the initial HHRA, due to smaller sample size, regardless of the depth from where the samples were collected, ProUCL selected the maximum detected concentrations as the EPC under statistical sampling approach. Typically, samples collected at depth should not contribute any risk due to external gamma pathway. Since those maximum detected concentrations at depths were become part of the EPCs, they contributed additional risk during the initial HHRA. During sample-by-sample approach, the receptors are assumed to be equally exposed to each sample regardless of the depth at which each was collected. No cover was considered for samples, collected at various depth. Hence, HHRA based on sample-by-sample approach also resulted in conservative risk. No changes have been made.
BRA3-47	3.6.1	3-110	34-37	Text states, "Since the RME receptors are exposed to contamination present in the shallow surface soil, soil sampling results from the shallow surface zone (0 to 15 ft bgs) for each EA were then used to determine the source term during the risk assessment." This source term (shallow soils) does not capture a groundwater drinking scenario, where receptors ingest groundwater that has been contaminated by soil COPCs leaching to groundwater through the full depth of the vadose zone.	Groundwater can be contaminated by contaminant leaching throughout the vadose zone.	Re a groundwater ingestion pathway, note that receptors may be exposed to contaminants throughout the vadose zone that migrate to groundwater.	Closed per IAMIT Determination 2019-007. No changes have been made.
BRA3-48	3.6.1	3-110	37-40	Text states, "Due to these reasons, a limited number of samples (<6) were used to determine the EPCs for many of the COPCs. In such cases, the maximum detected sample result was often selected as the EPC rather than a UCL (RPP-RPT-57218). Therefore, use of maximum detected concentration as the EPC resulted in a very conservative overestimation of risk for various EAs."	This conclusion is not necessarily true, especially in the case of small samples sizes (e.g., n<6).	Alternatively and more statistically sound, the highest 95% UCL, "suggested" by ProUCL output, should be used as the EPC (when nonjudgmental sampling has been performed). In cases where a 95% UCL cannot be calculated or is not suggested by ProUCL, EPC may default to the sample maximum. The maximum should not be used, simply because a 95% UCL exceeds the maximum. EPA has previously stated, "....<u>defaulting to the maximum observed concentration may not be protective when sample sizes are very small because the observed maximum may be smaller than the population mean" (OSWER 9285.6-10)</u>.	Resolved through IAMIT Determination 2019-006. The sentence commented on: "Therefore, use of maximum detected concentration as the EPC resulted in a very conservative overestimation of risk for various EAs." has been removed.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 15 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-49	3.6.1	3-111	12-13	Although these two conservative approaches (associated with COPC selection) are described that may overestimate risk, text is silent on issues that may underestimate risk. For example, risks may be underestimated, because chemicals with no toxicity factors may (in fact) be toxic, several exposure pathways have been excluded (e.g., food consumption for nonrad COPCs, groundwater ingestion, radon inhalation), interactions among chemicals may be synergistic or exhibit potentiation (greater than simple additivity), and transformation or degradation products (that are not accounted for) may contribute additional toxicity.	Uncertainties associated with analytical data, exposure assumptions, or toxicity assessment may result in both overestimation and underestimation of risks.	Revise text to include a more objective accounting of both conservative and nonconservative methodology in risk estimation.	The uncertainty associated with no toxicity values was addressed based on the response to the comment no BRA3-2. The uncertainty associated with excluding food chain pathway for chemicals has been addressed as follows: “Food chain pathways were evaluated for radiological COPCs. They were not evaluated for nonradiological COPCs. By not calculating nonradiological COPCs for food chain pathways, total site risk is underestimated.” See response to the comment no. BRA3-26 for issues related to the pathway. Lines 15 to 21 of page 3-114 (Section 3.6.3) provided detailed toxicity information related to interaction among chemicals. Therefore, no changes have been made.
BRA3-50	3.6.2	3-111	19-21	Please provide rationale for the statement, "Uncertainty associated with the exposure assumptions used in this risk assessment is low to moderate, and most likely overestimates the actual risks."	Statements ranking risk level should be supported with rationale.	Add rationale to statements which qualitatively or quantitatively describe level of risk or uncertainty.	The rest of the paragraph of this section presented the rationale to that statement. Therefore, this statement has been moved from the first paragraph to the end of this section.
BRA3-51	3.6.2	3-111	27-30	Text states, "The uncertainty from a relatively small sample size (i.e., less than five) requires a greater amount of conservatism during the estimation of mean, while a large sample size requires less conservatism during the estimation of mean. Therefore, maximum detected concentrations were selected as the EPCs for small sample size." The concluding (final) statement infers that the maximum detected sample concentration is a conservative estimate of EPC for small sample sizes. This is not necessarily true.	OSWER 9285.6-10 (EPA, 2002) states, “It is important to note, however, that defaulting to the maximum observed concentration may not be protective when sample sizes are very small, because the observed maximum may be smaller than the population mean.”	Revise this text to note that defaulting to max with small sample size (e.g., n<5) is allowed, only because UCL cannot be reliably calculated, not due to alleged conservatism.	Text has been revised as follows: “The initial HHRA was based on a statistical approach, the maximum detected concentrations were selected as the EPCs for the smaller sample size. However, for the HHRA based on the sample-by-sample approach, soil concentrations from individual sample results are selected as the effective EPCs.” The rest of text for that paragraph has been deleted.
BRA3-52	3.6.2	3-111	43-44	Although a comparison of EPC results (ProUCL 4 vs 5) is presented in Table 2 (Appendix G), the most recent version of ProUCL should be used (version 5.1) to calculate EPC in this BRA. It is not appropriate to use older versions of ProUCL software.	The most recent version of software (e.g., ProUCL) should be used, due to dynamic nature of software development (e.g., incorporation of updates, improvements, corrections, and so on).	Use the most recent version of ProUCL software (version 5.1, May 2016) to estimate EPC.	The text has been updated as follows: “Due to smaller sample size, the maximum detected concentrations were selected as the EPCs.” See disposition for BRA2-2.
BRA3-53	3.6.2	3-112	42-43	Text states, "Slope factors for external gamma radiation assume that the source is a semi-infinite slab." Re external radiation, FGR 12 notes that the radionuclide concentration in a given environmental medium is assumed to be uniform with a semi-infinite source for submersion in contaminated air and an infinite source region for immersion in contaminated water or exposures to contaminated soil.	Assumptions should be accurately stated with regard to source regions for external exposure in specific environmental media.	Clarify that the source for external gamma radiation in soil is characterized as infinite. In particular, FGR 13 states that the contaminated ground surface is an infinite plane, and soil occupies an infinite half space.	Concur. The following text has been added: “Slope factors for external gamma radiation assume that the source is uniformly contaminated with infinite depth.”
BRA3-54	3.6.3	3-114	24-28	Text states, "Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 11 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes, and were used when they were detected during radiological risk assessment." For metals, this text appears internally contradictory, because it does not make sense that "toxicity information was not available" and "risk coefficients are available for their radiological isotopes."	Risk coefficients are toxicity information.	Clarify text on why 17 metals (with radiological risk coefficients for some of their isotopes) were excluded.	The following text has been added to clarify such statement: “Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 11 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature and risk coefficients are available for their corresponding radiological isotopes. When they were detected, they were included as a part of the radiological risk assessment. No risk assessment was performed for non-detected analytes.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 16 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-55	3.6.3	3-115	7-26	These two paragraphs on overestimation of risk present a unilateral view. Nonconservative factors are not mentioned here. For example, chemicals with no toxicity factors may (in fact) be toxic, several exposure pathways have been excluded (e.g., food consumption for nonrad COPCs, groundwater ingestion, radon inhalation), interactions among chemicals may be synergistic or exhibit potentiation (greater than simple additivity), and transformation or degradation products (that are not accounted for) may contribute additional toxicity.	Uncertainties associated with risk characterization may result in both overestimation and underestimation of risks.	Revise text to include a more objective accounting of both conservative and nonconservative methodology in risk characterization.	See response to comment no. BRA3-49.
BRA3-58	3.2.1.1 (added in Rev. 3)	3-103 - 3-104	—	This section describes pooling data from similar depths and selecting maxima for contaminants when multiple samples were taken within a borehole. This does not represent a sample-by-sample approach.	A sample-by-sample approach involves calculating cancer risk and hazard quotients (and hazard indices for target organs) for each sample.	Please calculate cancer risks, hazard quotients, and hazard indices for each of the samples.	The results of ELCR, HQs and HI were collected for each sample within the borehole. An example of such calculation is provided in the following. Two boreholes (C8102 and C8104) within EA A plus B. Within C8102, five samples were collected at various depth. Among those samples, two samples (B2B1L8 and B2B1L9) were collected at the same depth (0-1 ft bgs) and the samples were analyzed for different contaminants. Therefore, risks were calculated for both sample IDs and the results of risk calculations were added together to represent the total risk for that one-foot interval. Separate risk values were also calculated for three sample depth intervals (5.7-9.7, 11.5-15.5 and 16.1-18.1) within that borehole. Similarly, five samples were collected within borehole C8104. Among those samples, two samples (B2FPF1 and B2FPF2) were collected at the same depth interval (6-12 ft bgs) and the samples were analyzed for different contaminants. Therefore, risks were calculated for both sample IDs and the results of risk calculations were added together to represent the total risk for that depth interval. Separate risk values were also calculated for three sample depths (5.7-9.7, 11.5-15.5 and 16.1-18.1) within that borehole.
BRA3-59	3.2.1.4 (added in Rev. 3)	3-103 - 3-104	—	Under "Calculation of ELCRs for Each Sample Result", text states that the maximum risk-to-source ratio over the 1,000 year period for each COPC was utilized, and then the COPC-specific risks for all COPCs were summed to determine sample-specific total ELCR. This method is potentially flawed, as the maximum risk for each COPC in a sample may occur at a different time for each COPC, so adding them together may not be appropriate.	As a made-up example, say COPC-1 has its maximum risk at time 0 years, while COPC-2 has its maximum risk at 600 years. In this made up case, adding the two maximum risks together is simply wrong, as the risks do not occur at the same time.	If the goal is to get the most accurate estimate of risk for a given sample, then the concentrations for each COPC need to be entered into RESRAD, and the total risk for all COPCs combined needs to be calculated at each time interval, and then the maximum risk determined. This way, the total risk will be temporally correct for all COPCs.	For radiological COPCs, risk-to source ratios were evaluated over the 1,000-year period. For both CERCLA Industrial Worker and CERCLA Residential scenarios, the maximum risk-to-source ratio for all radionuclides except U-233 and U-234, and the total risk for all radionuclides were occurred at year 0. However, the concentrations for both U-233 and U-234 are very small and contribute negligible amount of risk to the total risk. Therefore, the maximum risk-to-source ratios at year 0 were used during the radiological risk calculations for each receptor scenario.
BRA3-60	3.2.1.4 (added in Rev. 3)	3-103 - 3-104	—	Under "Calculation of ELCRs for Each Depth Interval within a Borehole", text states, "When multiple samples were present at the same depth interval in a borehole (i.e., reflecting different sampling events), the maximum soil concentration for each detected COPC was used as the source-term concentration at the specified depth interval." This statement is not clear. This may reduce the individual sample ELCR or HI (i.e., ELCR Sample or HI Sample), as a result of excluding (from summation) the lower ELCR or HQ for a COPC in that depth interval.	For example, if Sample-1 contains COPC-1, and Sample-2 also contains COPC-1, then summing the risks will double count the risk from that COPC. To be more concrete, if Sample-1 contains Cs-137 at 100 pCi/g resulting in a risk of R1, and Sample-2 contains Cs-137 also at 100 pCi/g resulting in a risk of R1, then the total risk is not R1 + R1, rather it is simply R1.	Present ELCR and HI results for each sample (i.e., ELCR Sample or HI Sample in App F and G), as the sum of all component COPC-specific HQs or ELCRs.	As mentioned within the response to comment no. BRA 3-58, two samples B2B1L8 and B2B1L9 were collected from the same depth (0 to 1 ft bgs) within borehole C8102. Cs-137 concentrations for both samples were 4.37 pCi/g and 4.17 pCi/g, respectively. However, as a conservative approach, the maximum detected concentration (4.37 pCi/g at B2B1L8) was selected as the source-term for Cs-137 within this depth interval.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 17 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-61	3.2.1.5 (added in Rev. 3)	—	Tables 3-15 and 3-16	Tables 3-15 and 3-16 need some further clarifications and show some mismatch with corresponding text. Also, it is unclear why the statistical approach (in some cases) has higher ELCRs (or HIs) than the sample by sample approach (when max was apparently used if UCL>max).	Tables and text should be consistent.	Table 3-15: Please explain red ELCR values in a foonote to table. Clarify why the statistical approach (in some cases) has higher ELCRs than the sample by sample approach (when max was apparently used if UCL>max). Re the CERCLA worker, text says, "For EA P, the calculated risk using both methods resulted in an unacceptable risk." This is also true for EAs A+B, C, and E. Re the CERCLA resident, text says, "It should be noted that calculated risk using both methods resulted in unacceptable risk at EA P." This also true for EAs A+B, C, E, H+I, J, L1+L2, and U. Typo in resident F+G sample by sample ELCR.	Under the statistical approach, due to small sample sizes at some locations, maximum observed concentrations were used as the EPCs for the COPCs with no regard for sampling depth. As an example, for EA C, the maximum concentrations for Sn-126 (Sample-B2FYM3) and Cs-137 (Sample- B2FPR8) are 53.1 and 7.09 pCi/g, respectively, and they were collected between 11 to 13 ft bgs and 1 to 1.5 ft bgs, respectively. Under the sample-by-sample approach, separate risks were calculated for these two samples. However, under statistical approach, due to the small sample size, the EPCs for those COPCs were 53.1 and 7.09 pCi/g, respectively. As a result, the radiological risk resulted based on statistical approach is higher than the results for individual samples. A footnote has been added to explain the rationale for highlighted values. The rationale behind the statement (For EA P,....) is that even though the ELCRs based on sample-by-sample approach resulted in higher risk (4E-4 vs 2E-4) as compared to that for statistical approach, the final outcome is the same as the ELCRs resulted by both approaches resulted in an unacceptable risk (>1E-4) for that EA. Concur. The ELCR results for EA F Plus G have been changed from 1E4 to 1E-4.
BRA3-61, continued	(added in Rev. 3)	—	—	—	—	Table 3-16: Clarify why the statistical approach (in some cases) has higher HI than the sample by sample approach (when max was apparently used if UCL>max). Text says, "Based on the WAC industrial worker and WAC residential receptor risk evaluations results for 10 EAs, the ELCRs based on sample by sample approach for four EAs (A plus B, F plus G, H plus I and L1 plus L2) are slightly higher than the corresponding ELCRs based on statistical approach." This is also true for EA P. Text also says, "It should be noted that calculated ELCRs using both methods did not result in unacceptable risk." This is not true for MTCA B for EA C. Text says, "The sample specific HIs for two EAs (A plus B and L1 plus L2) are slightly higher than their corresponding HIs based on a statistical approach." This is not true for A+B and MTCA C for L1+L2. Finally, text says, "It should also be noted that calculated HIs using both methods resulted in unacceptable risk." This is not true for MTCA C HI (also, this cited sentence should not refer to HI as risk).	Under the statistical approach, due to small sample sizes at some locations, maximum observed concentrations were used as the EPCs for the COPCs with no regard for sampling depth. As an example, the EPCs at EA C for aluminum, arsenic, cobalt, iron, lithium, manganese and vanadium are 9,510, 21.2, 11, 28,600, 12.1, 449 and 78.5 mg/kg, respectively. The highest hazard within EA C was calculated for sample B2FYM3, and the sample concentrations for aluminum, arsenic, cobalt, iron, lithium, manganese and vanadium are 9,440, 21.2, 9.6, 23,700, 12.1, 408 and 52.4 mg/kg, respectively. Therefore, due to higher EPCs, the statistical approach has higher HI than the sample-by-sample approach. Text has been updated as follows: “For the WAC industrial worker and WAC residential receptor, the ELCRs based on sample-by-sample approach for five EAs (A+B, F+G, H+I, L1+L2 and P) are slightly higher than the corresponding ELCRs based on statistical approach. It should be noted that calculated ELCRs for those five EAs using both methods did not exceed the upper risk threshold value of 1E-5.” For the WAC residential receptor, the HIs based on sample-by-sample approach for two EAs (A+B and L1+L2) are slightly higher than the corresponding HIs based on statistical approach. It should also be noted that calculated HIs using both methods resulted in unacceptable risk.
BRA3-62	3.2.1.5 (added in Rev. 3)	3-103 - 3-104	Table 3-15	The Sample-by-Sample Approach column shows a Range of ELCRs. Clarify what the range corresponds to. For example, is it the range of risk associated with the different depth intervals?	—	Clarify what the range corresponds to. For example, is it the range of risk associated with the different depth intervals?	The following footnote has been added (current Table 3-96): “The range of excess lifetime cancer risk represents the minimum and maximum excess lifetime cancer risks within the different depth interval.”
BRA3-63	3.2.3.1 (added in Rev. 3)	3-103/ 3-104	—	Cannot locate ECF-Hanford-10-0042, Rev 3.	Cited documents should be available.	Please provide a link or copy of ECF-Hanford-10-0042, Rev 3.	A copy of the document has been provided.
BRA3-64	3.2.3.2 (added in Rev. 3)	3-103/ 3-104	—	The arsenic (As) background concentration of 20 mg/kg is a policy decision, not measured Hanford soil background level (6.5 mg/kg).	Policy decisions should be clearly labelled.	Re As, add a note to clarify that As background concentration of 20 mg/kg is a policy decision, not measured Hanford soil background level (6.5 mg/kg). Using this actual background, there would be 6 exceedences for soil As.	Text has been updated as follows: “One sample result (21.2 mg/kg) exceeded the corresponding soil concentration protective of groundwater (2.92 mg/kg) and the arsenic value of 20 mg/kg provided in Memorandum 1221558.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 18 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-65	3.2.3.2 (added in Rev. 3)	3-103 – 3-104	—	The text states "Hexavalent Chromium – It should be noted that soil samples were reported as total chromium. The results…" This leaves out the lack of analysis of hexavalent chromium.	Hexavalent chromium was not measured.	Please modify the text to the following: Hexavalent Chromium – It should be noted that soil samples were reported as total chromium. Hexavalent chromium was not measured. The results…	Text has been updated as follows: "Soil samples were only analyzed for total chromium and were not analyzed for hexavalent chromium. Therefore, total chromium results were compared to the corresponding soil concentration protective of groundwater (2,000 mg/kg). The results showed that all sample results were less than the soil concentration protective of groundwater, derived for the River Corridor remedial investigation/feasibility documents. In response to Ecology's comment, if the chromium reported as total chromium is assumed to be present only as hexavalent chromium, then all sample results exceeded the soil concentration protective of groundwater (0.19 mg/kg)."
BRA3-66	3.2.3.2 (added in Rev. 3)	3-103/ 3-104	—	Several revisions and clarifications are needed for the Cr+6 discussion. Also, max soil background has no regulatory meaning. Soil Cr+6 exceeds soil CUL (to protect groundwater) and background in all cases (listed in Appendix H).	An accurate accounting of Cr species, background, and CULs is needed.	State that the soil Cr+6 was not measured. Delete max soil background concentration (no reguatory meaning). State that the soil CUL to protect groundwater for total Cr (2000 mg/kg) is based on the Kd for Cr+3 (1000 L/kg). Soil background concentration for Cr+6 is near zero (not 18.5 mg/kg), while the soil CUL to protect groundwater for Cr+6 is 0.19 mg/kg, using Kd=0 (see Table 3-14 here, as well as Table 10 in PNNL-13895r1). State that soil Cr+6 exceeds soil CUL (to protect groundwater) and background in all cases (listed in Appendix H).	See response to the comment no BRA3-65.
BRA3-67	3.2.3.2 (added in Rev. 3)	3-103/ 3-104, footnote 5	—	Several revisions and clarifications are needed for the Tl discussion. Soil Tl exceeds soil CUL (to protect groundwater) and background in 9 cases (listed in Appendix H).	MTCA/CLARC regards PPRTV Appendix toxicity values (X) as usable for deriving CULs.	State that the MTCA soil CUL to protect groundwater for Tl is 0.23 mg/kg (not 0.71 mg/kg), resulting in 9 exceedences of the soil CUL (to protect groundwater) and background for soil Tl (listed in Appendix H).	MTCA Method B value for Thallium was based on EPA's withdrawn toxicity value. Therefore, based on Federal MCLG of 0.50 ug/L and Kd value of 71 mL/g (CLARC 2019), the soil CUL protective of GW for Thallium is 0.71 mg/kg. No changes have been made.
BRA3-68	3.3 (added in Rev. 3)	3-105	2-8	Provide more context on the three supplemental risk assessments presented in this section. For example, explain why protection of groundwater is not evaluated in these supplements, because it has already been evauated in the past leaks document (if this is correct).	Evolution of the BRA document should be clearly explained.	Clarify why data in the three supplemental risk assessments were not presented as part of the initial BRA, why groundwater protection is not evaluated here, and why remedial alternatives (e.g., isolation barrier, concrete cover) are evaluated.	High levels of radiological contamination are present at three unplanned release (UPR) locations within WMA C - 200-E-81 (UPR-81), 200-E-82 (UPR-82), and 200-E-86 (UPR-86). Due to safety concerns, no samples were collected, and risk assessments were not performed at these UPR locations as part of the RFI. Therefore, supplemental human health risk assessments were conducted for both radiological and nonradiological COPCs present within these three UPRs to support the CMS alternatives evaluation process as documented in Waste Management Area C Phase 2 Corrective Measure Study Report (RPP-RPT-59379). It should be noted that Department of Ecology reviewed and approved the document. Past leaks evaluation was performed in RPP-RPT-59197 to compare the peak concentrations for several radiological and non-radiological contaminants against their corresponding groundwater standards. Therefore, such evaluation was not included in three supplemental risk assessments.
BRA3-69	3.3.1 (added in Rev. 3)	3-105	—	No information on composition of isolation barrier.	—	Provide more information on the isolation barrier, for example, what is its composition? Four inches is not very thick, even for concrete, and the barrier's ability to maintain structural integrity over 1,000 years needs to be addressed.	Such information was documented in Waste Management Area C Phase 2 Corrective Measure Study Report (RPP-RPT-59379). Therefore, no changes have been made.
BRA3-70	3.3.2 (added in Rev. 3)	3-106	12	Looks like a typo, "RPP-RPT-59397." Should this be RPP-RPT-59379?	—	Fix the typo (if so).	Concur. It should RPP-RPT-59379 instead of RPP-RPT-59397.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 19 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-71	3.3.2 and 3.3.2.2 (added in Rev. 3)	3-107, 3-109	—	Section 3.3.2 states "Therefore, radionuclides with a Kd value <0.15 mL/g are excluded due to high mobility in the vadose zone. Four (4) radionuclides were excluded based on Kd values corresponding to high mobility." Section 3.3.2.2 states "Similar to radiological contaminants, mobile nonradiological contaminants are not expected to be present within the shallow vadose zone (0 to 4.6 m [15 ft] bgs) and the inventories of the non mobile nonradiological contaminants are assumed to be uniformly distributed throughout the affected soil volume." The excluded contaminants aren't given. This introduces additional uncertainty to risk assessment.	The excluded contaminants are not too many to list, since the number of constituents would be limited by the BBI list. Also, if inventories were high, some of the mobile contaminants may remain near the surface.	List the contaminants that were excluded due to low mobilities, and the assumed inventories that would have been flushed from the soil. Ecology may ask that excluded contaminants actually be included.	RPP-RPT-58329, Rev. 2 provides a summary of the supplemental risk assessments that were performed as a part of the RPP-RPT-59379. Department of Ecology reviewed and approved RPP-RPT-59379. RPP-CALC-61238 provides detailed information regarding the contaminants that were included and excluded due to low mobility. No changes have been made.
BRA3-72	3.3.2.1 (added in Rev. 3)	3-108	Table 3-19	Risk estimate results where ELCR > 1.	—	Discuss the interpretation of a risk that is greater than unity, and discuss the validity of the equations and methods for estimating risk for such extremely high concentrations that correspond to extremely high radiation dose.	The results of the risk assessments under the baseline condition showed unacceptable risks are present for three UPRs. Linear dose and response relationship was assumed during the risk assessments. However, based on RAGS document, the linear relationship is only valid at low risk (ELCR<0.01). For sites with higher intake rates, an alternative method (One-Hit Equation) may be better option for calculating the carcinogenic risk. However, RESRAD model did not include such model. Due to the linear assumption between dose and response, large uncertainties associated with those risk calculations.
BRA3-73	3.3.2.1 (added in Rev. 3)	3-108	Table 3-19	Table 3-19 should include values for both radiation dose and ELCR.	Radiation doses associated with these contaminant levels are sufficient to cause death.	Add radiation dose (in mrem or rem) to Table 3-19, along with ELCR. Please include narrative regarding the interpretation of ELCR>1, as these situations illuminate that calculation of ELCR has limitations (since risk cannot exceed 1). Due to extreme conditions at these locations, this information should also be highlighted in the Executive Summary.	In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the excess lifetime cancer risks for all CERCLA receptor scenarios were compared with respect to the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. No site-specific Applicable or Relevant and Appropriate Requirement (ARAR) was established for acceptable radiological dose limit at the Hanford Site. Hence, no radiological dose assessments were performed in this RA and hence, dose results were not included in Table 3-19. It should be noted that due to elevated results of ELCR, a minimum of 3 ft of concrete barrier was proposed as a part of the corrective measure study within RPP-RPT-59379. Under such post-remediation condition, the ELCRs are within CERCLA acceptable risk range.
BRA3-74	3.3.2.2 (added in Rev. 3)	3-109	Table 3-20	Table 3-20 should contain soil concentrations for Pb for the 3 UPRs (per text). Also, there appears to be some discrepancies for Hg and Ni (Table 3-20 vs. Table 4-8).	Text and table should match.	Add Pb to Table 3-20, and reconcile Hg and Ni discrepancies in Tables 3-20 vs. 4-8.	Discrepancies between both tables have been corrected. It should be noted that Table 3-100 replaced Table 3-20.
BRA3-75	3.3.3 (added in Rev. 3)	3-110	17	Looks like "Floor Drain" should be "French Drain" (occurs other place too).	—	Change "Floor Drain" to "French Drain" (if this is so).	"Floor Drain" have been changed to "French Drain".
BRA3-76	3.3.3.1 (added in Rev. 3)	3-111	—	The title needs to indicate that this portion of the risk assessment if for the past tank leaks, rather than other types of releases such as pipeline leaks or tank overfills.	Past tank leaks are generally thought to have occurred near the lower portions of the tanks, which are deeper in the subsurface than pipeline leaks or tank overfills. The pipeline leaks and tank overfills do not have a 20-ft soil cover at this time.	Please change section title to Supplemental Human Health Risk Assessment for Past Tank Leaks	Title changes have been made as suggested.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 20 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-77	3.3.3.1 (added in Rev. 3)	3-111	7-16	There is an inconsistency between the rad (industrial scenario) vs. nonrad risk assessment approaches here. With a 20 ft soil cover over past leaks, direct exposure is an incomplete pathway for both rad and nonrad COPCS. Information for the CERCLA indusrial worker is presented in a confusing manner in this section.	Assumptions for soil cover should be consistent for rad vs. nonrad exposure scenarios.	Clarify that the rad industrial scenario evaluates direct exposure, despite a 20 ft soil cover which would typically block direct exposure. Later, text in the final paragraph of section 3.3.3.1 (p 3-113) indicates no risk from this industrial worker scenario. All of this text should be consolidated and made consistent with the nonrad exposure scenario.	Following changes have been made within Section 3.3.3.1. Text for the first three paragraphs have been revised as follows: "Supplemental human health radiological dose and risk assessments were performed for past leaks from six tanks. The CERCLA construction worker scenario was evaluated because releases from these tanks were at 6.1 m (20 ft) bgs and it assumes that subsurface contamination is brought to the surface from excavation activities Because the releases occurred below 15 ft bgs, there are no complete direct exposure pathways for either radiological or nonradiological contaminants." Last paragraph of this section has been deleted.
BRA3-78	3.3.3.1 (added in Rev. 3)	3-111	—	The use of the 'construction worker' and 'industrial worker' exposure scenarios is confusing. Is there a difference between these scenarios? The exposure pathways are stated to be the same.	—	Clarify.	"Industrial Worker" and "Construction Worker" scenarios are defined in section 3.1.2.5.1 and 3.1.2.5.3, respectively.
BRA3-79	3.3.3.1 (added in Rev. 3)	3-111	—	Discuss differences between RESRAD version 6.5 and 7.0, and discuss how those differences might impact results.	—	—	Following information is provided for informational purpose: The radiological transformation basis (half lives, decay rates, yield and amount of radiation emitted) for RESRAD 6.5 and RESRAD 7.0 are based on ICRP 38 and ICRP 107, respectively. The updated risk coefficients based on ICRP 107 were used during supplemental risk assessments for UPRs. Except for inhalation, risk coefficients based on both ICRPs are the same for all radiological COPCs. Inhalation risk coefficients for most of the radiological COPCs based on ICRP 107 are less as compared to those based on ICRP 38. It should be noted that external gamma pathway contributes 100% of the total risk for all three UPRs. Therefore, the differences will not cause any impact to the total risk.
BRA3-80	3.3.3.1 and 3.3.3.2 (added in Rev. 3)	3-113, 3-115	Tables 3-25 and 3-26	These tables do not have units for the doses and concentrations. Are the radionuclide doses mrem/y?	—	Please put the units on the tables.	Unit for dose (mrem/yr) has been included in Table 3-25 (current Table 3-105) and unit for concentration (pCi/g) has been included in Table 3-26 (current Table 3-106).
BRA3-81	3.3.3.2 (added in Rev. 3)	3-113	27-28	Although it does not change conclusions, correct Hanford soil background concentrations for Fe, Pb, Ni, and U.	DOE/RL-92-24	Revise Hanford background soil concentrations for Fe, Pb, Ni, and U.	Concur. The background concentrations for iron, lead, nickel and uranium are 32, 600, 10.2, 19.1 and 3.21 mg/kg, respectively. Table 4-3 of RPP-CALC-61128 includes correct background concentrations. However, all text within 2nd paragraph were deleted. The following text was added at the end of 3rd paragraph: "It should be noted that nonradiological COPCs were not identified for the surface contamination or French drain."
BRA3-82	3.4.1 (added in Rev. 3)	3-122	—	The text states "Application of two conservative approaches during the selection of COPCs resulted in additional contribution of risks to total risk and thereby, overestimates the actual risks." There is uncertainty in this statement. At best it can only be stated that this <u>may</u> result in an overstimate of risk.	This statement turns an unknown (the validity of the additional risk) into a known (an overestimate of risk).	Please revise the statement to "Application of two conservative approaches during the selection of COPCs resulted in additional contribution of risks to total risk and thereby, <u>may</u> overestimate~~s~~ the actual risks."	Text changes have been made as suggested.
BRA3-83	4.0 (added in Rev. 3)	4-3	2	Looks like a typo, "RPP-RPT-59397." Should this be RPP-RPT-59379?	—	Fix the typo (if so).	See response to the comment no. BRA 3-70.
BRA3-84	4.6 (added in Rev. 3)	4-25	40-41	Although it does not change conclusions, correct Hanford soil background concentrations for Fe, Pb, Ni, and U.	DOE/RL-92-24	Revise Hanford background soil concentrations for Fe, Pb, Ni, and U.	Concur. The background concentrations for iron, lead, nickel and uranium are 32,600, 10.2, 19.1 and 3.21 mg/kg, respectively. Table 4-3 of RPP-CALC-61128 includes correct background concentrations. Hence, text has been updated to reflect the actual background concentrations.
BRA3-85	4.6 (added in Rev. 3)	4-25	43	"Table 3-23" should be "Table 3-26."	—	Change "Table 3-23" to "Table 3-26."	Concur. Table number has been revised based on inclusion of additional tables.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 21 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA3-86	4.6 (added in Rev. 3)	4-26	13-16	Text states, "For nonradiological contaminants, when an HQ value is less than 1, the concentration is below the soil benchmark and the constituent is deemed to pose a negligible risk and is not retained for further evaluation." This is inappropriate if there are nonrads that effect a common target organ (e.g., Pb and U affect kidney in mammals, so HQs are additive). In this case, HI<1 becomes the critical metric (e.g., see ERAGS Highlight 2-2).	—	Discuss the importance of both HQ and HI for evaluating nonrad COPCs.	RPP-RPT-58329, Rev. 2 provides a summary of the supplemental risk evaluations that were performed as a part of RPP-RPT-59379. It should be noted that RPP-RPT-59379 was reviewed and approved by Department of Ecology. Hence, no changes have been made in RPP-RPT-58329, Rev 2. It should be noted that the most conservative PRGs were selected during the calculation of HQs. The most conservative Tier 2 PRGs for lead and uranium were derived based on the most sensitive wildlife receptors of killdeer and badger, respectively. Hence, those HQs are not additive. In addition, the methodologies for performing SLERA during the supplemental risk assessment are consistent with the methodologies that were utilized during the BRA.
BRA3-87	4.6 (added in Rev. 3)	4-28	6-14	This AUF issue lies in the domain of the ERAGS/SMDP process which Ecology and USDOE agreed to eliminate in this document, due to lack of Ecology/USDOE consensus. Furthermore, no reference is provided for the badger home range (HR) value of 160 ha. The IUCN Red List of Threatened Species (citing data from Sargent and Warner, 1972) specifies a HR range of 2-725 ha for the American badger. Notably, the AUF approach also ignores contaminated waste sites near WMA C which may overlap HR.	http://www.iucnredlist.org/details/41663/0	Delete this paragraph on AUF.	RPP-RPT-58329, Rev. 2 provides a summary of the supplemental risk evaluations that were performed as a part of RPP-RPT-59379. It should be noted that RPP-RPT-59379 was reviewed and approved by Department of Ecology. Hence, no changes have been made in RPP-RPT-58329, Rev 3. The home range for badger can be obtained from the following website: https://animaldiversity.org/accounts/Taxidea_taxus/.
BRA4-1	4.0	4-1	general comment	It is not clear if, or how, DOE-STD-1153-2002 (A Graded Approach For Evaluating Radiation Doses To Aquatic And Terrestrial Biota) is used in the ecological risk assessment.	—	Discuss how DOE-STD-1153-2002 is used in the risk assessment.	A specific reference to the DOE-STD-1153-2002 (A Graded Approach For Evaluating Radiation Doses To Aquatic And Terrestrial Biota) has been added on Page 4-1, beginning on line 20. In addition, the following sentence has been added at the beginning of line 29 (Section 4.4.1.4). “For the purposes of developing Tier 1 values, radionuclide exposure in the wildlife receptor species was estimated based on the internal and external radiation exposure models (the kinetic-allometric modeling methodology) incorporated into DOE-STD-1153-2002. That kinetic-allometric modeling methodology is incorporated into Level 3 of the RESRAD-BIOTA Version 1.5 tool, DOE/EH-0676 (DOE-STD-1153-2002).”
BRA4-2	4.0	4-2	14 - 22	Is a sum-of-fractions approach used?	The sum of several contaminants that have concentrations below a screening level can end up having significant contribution to risk.	It appears that a sum-of-fractions approach is not used. Clarify, and discuss why it is not used.	As noted in the previous comment, DOE’s Graded Approach guidance document was used in conducting the SLERA (clarifying text added on page 4-1), which includes use of the SOF approach. Lines 27 to 37 of page 4-9 provided a detailed summary of the “Sum-of-fraction approach.”
BRA4-3	4.0	4-2; 4-3	45-46; 1-9	As part of the SMDP process after Tier 1 and Tier 2 screening, text states, "The site-wide EPCs for those COPECs were used as the source term during this evaluation." The BRA and SLERA have divided WMA C into EAs. Because site-wide sampling is biased (by design), a statistical approach to extrapolate to the wider population (which requires random sampling) is not warranted. Re the SLERA, use of a site-wide EPC is not compatible with the HQ and SOF values that were calculated on an EA basis.	Among the six COPECs with HQ>1 in the Tier 2 screen, three COPECs (B, Mo, Tl) have screening values based on plants and soil biota (Table 4-6); these are immobile receptors (e.g., plants), or have limited mobility (e.g., soil biota). Site-wide EPCs are less relevant than those for co-located soil values.	See the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 22 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA4-4	4.1	4-4	41-43	Text states, "Future land use for the inner area of the Central Plateau will be industrial and will remain under Federal ownership and control." Revise this statement, because land use cannot be guaranteed, due to increasing uncertainty into the future.	Future land use becomes increasingly uncertain, as time goes on.	Revise the statement on future land use to be an objective, rather than a reality.	The text has been revised as follows: "Future land use for the inner area of the Central Plateau is currently designated as industrial."
BRA4-5	4.3	4-6	10 - 11	Not clear if sum-of-fractions is used.	—	Clarify if sum-of-fractions approach is used, in particular for radionuclides.	See response to comment no BRA4-2.
BRA4-6	4.4.1.1	4-12	44-46	Re olfactory bulb uptake, text states, "In addition, manganese and cadmium are not significant Hanford Site contaminants that needed to be evaluated using such site-specific methods." However, HQ>1 for Cd was observed for both generic (Table 4-2) and Tier 1 (Table 4-4) screens. Therefore, Cd should not be dismissed as an insignificant COPEC in this SLERA.	Although "methods for olfactory exposure and risk characterization are not well established," this pathway should be noted as an uncertainty.	Because HQ>1 for Cd in both generic and Tier 1 screens, Cd should not be dismissed as an insignificant COPEC in this SLERA.	Concur. The following sentences have been included in Section 4.7. "It has been noted that olfactory bulb uptake in fossorial mammals affords a significant exposure route to manganese and cadmium in soils. The site-specific methods for olfactory exposure and risk characterization are not well established for manganese and cadmium, and hence, an uncertainty exist."
BRA4-7	4.4.1.2	4-13	26	Note that omission of reptiles and amphibians constitutes an uncertainty in the SLERA.	Uncertainties in exposure assessment should be noted.	Note the omission of reptiles and amphibians as an uncertainty in the SLERA.	As stated in the Tier 1 SSL document (CHPRC-00784, pg 16), EPA EcoSSLs were not developed for reptiles, amphibians, and soil microbes because EPA concluded that toxicity data for amphibians and reptiles were insufficient for EcoSSL development. Concur to adding the lack of toxicity data to evaluate amphibians and reptiles to the uncertainty section of the SLERA.
BRA4-8	4.4.1.2	4-16	12-14	A default value of BAF=1 may not be conservative for certain organic lipophilics (e.g., PBTs, POPs, pesticides).	Default BAF values should be conservative for all contaminants.	Clarify that BAF=1 is a default value for nonrad inorganic and rad contaminants.	The following sentences have been added: "Table 6-4 of CHPRC-00784 lists the BAFs for all contaminants and their sources. The table shows that the BAF values for a number of COPECs are greater than 1."
BRA4-9	4.4.1.3	4-16	36-44	MTCA Table 749-5 should also be listed as a source for nonrad TRVs for birds and mammals.	MTCA lists TRVs for several metals, pesticides, other chlorinated organics, and other nonchlorinated organics for the shrew, vole, and robin.	If more site-specific or receptor-specific TRVs are not available, MTCA Table 749-5 could be used as a source for TRVs for birds and mammals.	The following sentences have been added as a third paragraph of Section 4.4.1.3. "MTCA Tables 749-4 and 749-5 requirements do not provide the citations for the exposure factors, BAFs, or TRVs, so Ecological Indicator Soil Concentrations for wildlife are not readily comparable with wildlife EcoSSLs. Therefore, during the development of Tier 1 SSLs, instead of calculating ecological indicator soil concentrations using parameters listed in tables 749-4 and 749-5, Hanford-specific exposure factors and bioaccumulation model included in EPA's EcoSSL guidance were used. It should be noted that ecological indicator soil concentrations for plant, soil biota and wildlife presented in WAC 173-340, Table 749-3 were considered during the development of generic screening levels for COPCs. The screening values for soil biota and wildlife were based on the exposure model provided in Table 749-4 and chemical-specific values provided in Table 749-5."
BRA4-10	4.4.1.3	4-17	5-7	Text states, "There are a number of uncertainties associated with literature-based effects data for plants and soil invertebrates. Therefore, CHPRC-00784 did not attempt to select literature-based effect values; hence, no Tier 1 SSLs were derived for plants and soil invertebrates." Please describe these uncertainties.	Uncertainties should be described.	Describe uncertainties associated with literature-based effects data for plants and soil invertebrates and how these uncertainties compare with those associated with bioassay-based effects data used to derive Tier 2 nonrad PRGs for plants and invertebrates (ECF-HANFORD-11-0158).	Texts for the 4th line in the 1st paragraph of Section 4.5.1 have been revised as: "Among those, the highest observed no-effect concentration (NOEC) value with the lowest uncertainty/highest confidence was identified as the final recommended PRG."

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 23 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA4-11	4.4.1.3	4-17	9-15	The rad COPEC description in Section 4.4.1.3 should also specify rad dose limits for terrestrial biota, underlying BCGs or SSLs (i.e., 1 rad/d for terrestrial plants and 0.1 rad/d for terrestrial animals). Note too that the EU has proposed a generic screening value (PNEDR) of 10 uGy/h (0.024 rad/d) for nonhuman biota (Anderson et al. 2009. JER 100:1100-1108).	Dose limits should be specified from several sources to provide perspective.	Specify rad dose limits for terrestrial biota, including the lower EU recommendation.	The following sentence has been added after line 29 within Page 4-17. “It should be noted that Andersson et el (2009) provided ecological screening values for generic, vertebrates, invertebrates and plants and they are 10, 2, 200 and 70 µG/hr, or 0.024, 0.0048, 0.48, 0.168 rad/d, respectively.” The following reference has been added in the Reference section: Pal Andersson, Jacqueline Garnier-Laplace, Nicholas A. Beresford, David Copplestone, Brenda J. Howard, Paul Howe, Deborah Oughton, Paul Whitehouse, 2009. Protection of the environment from ionising radiation in a regulatory context (protect): proposed numerical benchmark values. Journal of Environmental Radioactivity, 100 (2009) 1100–1108.
BRA4-12	4.4.1.3	4-17	12-15	Please provide more detail on how radionuclide transfer parameters (i.e., concentration ratios) were derived by Beresford et al (2008) for birds and mammals.	Methodology needs to be described adequately.	Provide more detail on how radionuclide transfer parameters (i.e., concentration ratios) were derived by Beresford et al (2008) for birds and mammals, including a description of this source of uncertainty.	Concur. The following sentences have been added on page 4-17, starting on line 15: “For example, Beresford et al 2008 derived transfer factors by extracting data from original literature references. Where desired data necessary for establishing concentration ratios were not reported in original publications Beresford et al. utilized a set of standard assumptions so that the data could be converted to estimate concentration ratios (CRs). For a significant number of constituents the original literature did not provide a basis for establishing CRs and in these instances CRs were developed using (i) a CR for a taxonomically similar organism (ii) an available CR for a similar reference organism, (iii) a CR value recommended in or derived in previous review articles and (iv) use of specific activity models (tritium, carbon 14).”
BRA4-13	4.5	4-19	29-41	Re plants and soil invertebrates, clarify why Tier 2 SSLs were developed but not Tier 1 SSLs, given that CHPRC-00784 states that Tier 2 values represent Hanford Site-specific values and several of the sources for Tier 2 values are not Hanford Site-specific (e.g., EcoSSLs, Sheppard et al [2005], MTCA Table 749-3).	Rationale for the tiered approach (used to develop eco PRGs) should be clearly stated and consistently implemented.	Re plants and soil invertebrates, clarify why Tier 2 SSLs were developed but not Tier 1 SSLs, given that CHPRC-00784 states that Tier 2 values represent Hanford Site-specific values and several of the sources for Tier 2 values are not Hanford Site-specific (e.g., EcoSSLs, Sheppard et al [2005], MTCA Table 749-3).	The following sentences have been added as a new second paragraph in Section 4.5. “Published plant and soil invertebrate screening values for aluminum, arsenic, berrylium, boron, chromium, cobalt, lithium, maganese, silver, thallium, tin, uranium and vanadium are the most conservative generic screening values for various organisms. Except for four chemicals - berrylium, silver, thallium and tin, those published screening values for other nine chemicals are less than their corresponding background concentrations. Therefore, background concentrations were selected as generic screening values for those nine chemicals. None of four chemicals were retained during the generic screening. Hence, no screening was performed for plants and soil invertebrates during Tier 1 screening.”
BRA4-14	4.5	4-19	41-43	Re Tier 2 SSLs for plants and soil invertebrates, text states, "Multiple values were evaluated for each analyte/receptor combination and the highest value with the lowest uncertainty/highest confidence (as described by the original authors) was identified as the final recommended PRG." A <u>lower</u> value with low uncertainty/high confidence should be selected as the PRG.	In a regulatory framework, lower SSLs should be selected as PRGs.	Revise text to indicate that conservatism (a lower concentration) and confidence (lower uncertainty) should be optimized when selecting a PRG.	The following sentence has been revised as follows: “The highest concentration tested (no effects were observed at or below these concentrations) with the lowest uncertainty/highest confidence was identified as the final recommended PRG.”
BRA4-15	4.5.1	4-21	34-35	Note that "Memorandum 1221558" is a policy decision that specifies a soil As concentration of 20 mg/kg (MTCA Method A) that far exceeds a 1E-6 risk limit (i.e., 3E-5 risk, as calculated with MTCA Method B), as well as the 90th percentile of lognormal measured background concentrations for As at Hanford (6.47 mg/kg, as listed in DOE/RL-92-24).	Policy decisions need to be adequately explained.	Explain the use of MTCA Method A for As (20 mg/kg), as substituting for natural background at Hanford (6.47 mg/kg) when the two differ by more than a factor of 3 (20/6.47).	Bullet c has been revised as follows: “For arsenic, Ecology has chosen to use Method A value of 20 mg/kg for the Hanford Background (Ecology Memorandum 1221558).”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 24 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA4-16	4.6	4-26	7-10	Text states, "In addition, a limited number of biased soil samples were collected for a number of EAs. Due to small sample size, the maximum detected concentrations were the EPCs for those EAs. Those EPCs are not representation source terms at which representative species will be exposed. Therefore, SMDP steps were performed....." SMDP steps cannot entirely resolve problems stemming from biased sampling, as well as inadequate sample numbers to derive representative EPCs.	An EPC should reflect exposure. Local EAs are a better measure of exposure for immobile and low mobility receptors (e.g., plants, soil biota, some small mammals), relative to the larger overall waste site. ERAGS notes that SMDPs are communication points intended to reduce uncertainty associated with the risk assessment and should be approved with consensus among all involved parties.	Any SMDP process should reflect consensus among all involved parties (according to ERAGS). Also, see the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1. Therefore, Section 4.6 including subsection 4.6.1 has been deleted.
BRA4-17	4.6.1	4-27	8-9	Text states, "During this evaluation for nonradiological contaminants, the site-wide EPCs for COPECs were compared against their corresponding Tier 1 SSLs based on LOAEL TRVs to calculate an HQ." This same methodology was also applied to Tier 2 nonrads and Tier 1 rads. By employing a "site-wide EPC," the SLERA is fundamentally altered by averaging EAs across the entire WMA-C. When characterizing risk, this eliminates waste source specificity (Table 2-1) needed for any spatially targeted remediation and can potentially increase or decrease HQ, depending on contaminant spatial distribution.	—	See the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1. Therefore, text within entire Section 4.6 has been deleted.
BRA4-18	4.6.1	4-27	14-23	Tier 1 nonrads with HQ>1 (Cd at EAs E and R, V and Zn at EA P, see Table 4-4) were eliminated when HQ was re-calculated with a site-wide EPC (HQ<1) or when considering background for V. Text is silent on how a site-wide EPC (for each nonrad) is calculated, and more importantly, use of site-wide EPCs is not warranted.	—	See the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1. Therefore, text within entire Section 4.6 has been deleted.
BRA4-19	4.6.1	4-27	25-30	Tier 1 rads with SOF>1 (Sr-90, H-3, Cs-137 at EA P, see Table 4-5) were eliminated, when SOF was re-calculated with a site-wide EPC (SOF<1). Text is silent on how a site-wide EPC (for each rad) is calculated, and more importantly, use of site-wide EPCs is not warranted.	—	See the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1. Therefore, text within entire Section 4.6 has been deleted.
BRA4-20	4.6.2	4-27 to 4-29	entire section	Section 4.6.2 describes a systematic elimination of all 6 Tier 2 nonrad COPECs with HQ>1 (see Table 4-7: B at EA J; Mo at EAs H+I, L1+L2, U; Se at EAs L1+L2, U; Tl at EA R, SO4 at EAs A+B, H+I, BEHP at EAs F+G, J, L1+L2, P) by recalculating HQ with a site-wide EPC (HQ<1) . Text is silent on how a site-wide EPC (for each COPEC) is calculated, and more importantly, use of site-wide EPCs is not warranted.	—	See the comment for Section 3.5.11.1, p. 3-78, lines 32-35, discontinue the use of 'site-wide EPC' values. Compare individual sample results against the pertinent risk thresholds. Highlight exceedences and carry the contaminants and their locations forward for remedial decision making.	See response to the comment BRAES-1. Therefore, text within entire Section 4.6 has been deleted.
BRA4-21	4.6.2	4-28	32-35, 45-46	Without institutional controls, Ecology requires a standard POC down to a depth of 15 ft for terrestrial eco receptors (WAC 173-340-7490[4][b]).	Conditional POCs require institutional controls (WAC-173-340-7490[4][a]).	Without institutional controls, Ecology requires a standard POC down to a 15 ft depth for terrestrial eco receptors (WAC-173-340-7490[4][b]).	All statements related to the bioactive zone of 10 ft have been removed from the report.
BRA4-22	4.6.2	4-28	40-43	Re BEHP, specify HQ>1 at EA J too (Table 4-7, HQ=12.2).	All exceedances of the HQ limit (HQ=1) should be listed at each EA.	Re BEHP, specify HQ>1 at EA J too (Table 4-7, HQ=12.2).	See response to the comment BRAES-1 and BRA4-21. Therefore, Text within entire Section 4.6 has been deleted.
BRA4-23	4.6.2	4-29	1-5	The description of data here for BEHP at EA P (2 "J" qualified detects) conflicts with data presented in Table N-3 in the WMA C RFI (RPP-RPT-58339, Rev 0). In particular, Table N-3 shows 6 "J" qualified detects for BEHP for shallow samples at EA P, ranging from 0.80-5.05 mg/kg.	Data should be described consistently in related documents.	Re BEHP at EA P, revise text so that it is consistent with data in Table N-3 in WMA-C RFI (RPP-RPT-58339, Rev 0).	The descriptino fo BEHP at EA P is correct. Table N-3 had an error, Appendix Q of the RFI report includes the correct data. Table N-3 should show 3 qualified detects for BEHP for shallow samples at EA P (2,300 µg/kg, 2,040 µg/kg, and 804 µg/kg).

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 25 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA4-24	4.6.2	4-29	9-11	Again, text is silent on how a site-wide EPC (for each COPEC) is calculated. More importantly, use of site-wide EPCs is not warranted.	—	—	See response to the comment BRAES-1. Therefore, Text within entire Section 4.6 has been deleted.
BRA4-25	4.7	4-29	37-42	Text states, "A data review was performed to compare the result of the minimum detection limit for each analyte with respect to its corresponding NOAEL- and LOAEL-based Tier 1 SSL. It should be noted that the detection limits for analytes were based on 10% of their ecological SSLs in most cases. The results of the data review showed that the minimum detection limit and maximum reporting limit for all non-detect sample results did not exceed their corresponding NOAEL- and LOAEL-based SSL." Although this may be true for Tier 1 SSLs, this is apparently not true for all Tier 2 SSLs (e.g., BEHP, as noted in Section 4.6.2).	The reporting limit should be below the screening limit to adequately assess the screening limit.	Please acknowledge the uncertainty associated with inadequate MDLs or reporting limits to assess Tier 2 SSLs (e.g., BEHP).	Concur. The sentences have been updated as follows: The results of the data review showed that except for bis (2-ethylhexyl) phthalate, the minimum detection limit and maximum reporting limit for all non-detect sample results did not exceed their corresponding NOAEL- and LOAEL-based SSL and Tier 2 SSLs.
BRA4-26	4.7	4-30	4-6	Text states, "Evaluation of soil concentration data that extends beyond the biologically active zone would have a tendency to overestimate the potential for risk discussed in this SLERA." This is true only if deep soil concentrations are higher than shallow concentrations (which is not always the case).	—	Delete the sentence, "Evaluation of soil concentration data that extends beyond the biologically active zone would have a tendency to overestimate the potential for risk discussed in this SLERA."	Last two sentences have been deleted.
BRA4-27	4.7	4-30	10-13	Text states, "The lack of COPEC SSLs may not adequately address risk potential, although early consideration of remedial alternatives protective of receptors with SSLs should be protective of receptors lacking sufficient toxicity data." Please clarify this statement.	—	Please clarify how "early consideration of remedial alternatives" can address uncertainty associated with COPECs without SSLs.	See response to comment BRA4-18.
BRA4-28	4.7	4-30	16-17	Text states, "The maximum measured concentration provides a conservative estimate for sessile biota or those with a limited home range." This is not necessarily true, due to small sample size and lack of inferential statistics (e.g., 95UCL). The sample max does not represent the population max, so any a claim of conservatism with respect to the population cannot be made.	—	Delete the sentence, "The maximum measured concentration provides a conservative estimate for sessile biota or those with a limited home range."	The sentence has been deleted.
BRA4-29	4.6 (added in Rev. 3)	4-28	16-21	Note that future land use is ultimately unknown and that ecological habitat may be restored over time.	Future land use is unknown.	Delete this paragraph on habitat and land use.	See response to the comment no BRA 3-86. It should be noted that the paragraph provides information related to the existing use of the site and surrounding properties. Information related to the future land use is not provided.
BRA5-1	5.2	5-2	34-43	Clarify why the MTCA Method B screening level values for groundwater for lindane and beta-BHC are used to assess their aqueous concentrations above the water table (rather than in groundwater). Also, note that these results indicate that lindane and beta-BHC may adversely impact groundwater after 1000 years.	Modeling analysis should be transparent.	Clarify why the MTCA Method B screening level values for groundwater for lindane and beta-BHC are used to assess their aqueous concentrations above the water table (rather than in groundwater). Also, note that these results indicate that lindane and beta-BHC may adversely impact groundwater after 1000 years.	Closed per IAMIT Determination 2019-007. It should be noted that all information related to the STOMP model results for lindane and beta-BHC were deleted within RPP-RPT-58329, Rev. 2. No changes have been made.
BRA5-2	5.3	5-3	44	Replace "divided to" with "divided by."	Editorial.	Replace "divided to" with "divided by."	Text has been changed as suggested.
BRA5-3	5.3	5-4	34-35	Same comment on "site-wide EPC" (see comment for Section 4.0, Page 4-2, Lines 45-46).	—	—	See response to the comment no BRAES-1. All information from line 22 to line 46 has been deleted. Text was updated to identify both radiological and nonradiological COPECs, retained for remedial action.

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 26 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA5-4	5.3	5-4, 5-5	37-46, 1-7	The Tier 1 assessment is performed on COPECs that were retained from the generic screening. In contrast, Tier 1 and Tier 2 screens are performed independently. That is, there are separate results (i.e., a unique mix of COPECs/EAs) for nonrads for Tier 1 (Table 4-4) vs. Tier 2 (Table 4-7). Generic screen exceedances (HQ>1 and SOF>1) are disregarded due to generic status, while more site-specific Tier 1 and Tier 2 exceedances are improperly eliminated by invoking use of a site-wide EPC. Use of a site-wide EPC was employed with a unilateral SMDP process (i.e., consensus was not reached between USDOE and Ecology), and Ecology rejects this site-wide EPC adjustment for reasons outlined in our previous comment (Section 4.0, Page 4-2, Lines 45-46). Therefore, the final conclusion of retaining no COPECs appears flawed in this SLERA.	ERAGS notes that SMDPs are communication points intended to reduce uncertainty associated with the risk assessment and should be approved with consensus among all involved parties. As such, the purpose of the SMDP process is to reduce uncertainty, not to necessarily eliminate COPECs. For example, if an SMDP highlights new high quality research that shows increased sensitivity in a receptor to a specific COPEC, uncertainty is reduced (with respect to receptor sensitivity), but this may lead to retention of that COPEC (rather than its elimination).	Please clarify that Tier 1 and Tier 2 screens are performed independently. While the Tier 1 screen should define COPECs for rads with SOF>1 (since there is no Tier 2 for rads), the Tier 2 screen should define COPECs for nonrads with HQ>1, based on greater site-specificity than Tier 1. Retain 6 nonrad COPECs from Tier 2 (B, Mo, Se, Tl, sulfate BEHP) at several EAs (Table 4-7) and 3 rad COPECs from Tier 1 (Sr-90, H-3, Cs-137) at EA P (Table 4-5) for further baseline ecorisk evaluation at WMA-C.	See response to the comment BRA5-3.
BRA5-5	5.1 (added in Rev. 3)	5-1	15-17	A new sentence was added: "Depending upon the calculation of source-term concentrations for both radiological and nonradiological COPCs, HHRA for WMA C were performed for 10 EAs using a statically based approach and a sample-by-sample approach." This implies that two valid approaches were used to analyze data.	The statistical approach is not valid, given judgmental sampling.	Explain that the valid sample by sample approach followed an invalid statistical approach, as a result of judgmental sampling.	Text changes have been made as follows: Initially, HHRAs were performed for 10 EAs to addresses potential exposures to industrial worker, construction worker, maintenance/surveillance worker, trespasser, hypothetical onsite residential receptors and two Native American residential receptors. The source-term concentrations for both radiological and nonradiological COPCs were calculated using a statistical-based approach. Because judgmental samples were collected from those EAs, additional HHRAs were performed by utilizing sample-by-sample approach source-term concentrations to address potential exposures to CERCLA residential and industrial scenarios for radiological contaminants, and to WAC residential and industrial scenarios for nonradiological contaminants.
BRA5-6	5.1 (added in Rev. 3)	5-2	25-27	Text states, "For carcinogenic COPCs, the results of HHRA for both the statistically- and sample by sample-based risk assessment approaches identified the same EAs with ELCRs greater than the EPA upper risk threshold of 1 × 10-4 and the same major risk contributors." This statement is not entirely true.	Text and table should match.	Re statistical vs. sample be sample approaches for identifying EAs with exceedences, call out discrepancies for workers at H+I and L1+L2 (Table 3-15).	Not Concur. Based on the results presented in Table 3-15 (current Table 3-45) for CERCLA industrial worker scenario, the ELCRs for EA H Plus I and EA P based on sample-by-sample approach are more conservative than their corresponding ELCRs based on statistical approach. However, for EA P, the calculated risk using both methods resulted in an unacceptable risk.
BRA5-7	5.2 (added in Rev. 3)	5-4	26-28	Text states, "The results of the data evaluations showed that the EPCs for three COPCs (cadmium, beta-BHC and lindane) exceeded their corresponding three-phase model concentrations and background levels at a number of exposure areas." In addition to these 3 COPCs, the sample by sample approach (direct comparsion method) also identified Cr+6 and Tl as exceedences (see section 3.2.3).	—	—	The following text has been added: “The results of the assessment showed that the individual sample results for five COPCs (arsenic, cadmium, hexavalent chromium, thallium and beta-BHC) exceeded their corresponding soil concentrations protective of groundwater and/or background concentrations. Hexavalent chromium and thallium were not part of the data assessment based on a statistical approach. Hexavalent chromium was not measured during site characterization. The reported sample results for total chromium were assumed to hexavalent chromium during the sample-by-sample approach data evaluation. A screening level soil concentration based on groundwater protection was used for thallium as the reference dose value for screening purposes only.”

Table J-2. Review Comment Record – RPP-RPT-58329, Baseline Risk Assessment for Waste Management Area C, Rev. 2. (sheet 27 of 27)

Comment number	Section	page	Lines, Figure or Table #	Comment	Basis	Recommendation	Disposition
BRA5-8	5.3 (added in Rev. 3)	5-6	1-4	Test states, "However, this exceedance is considered of little significance for current and future vegetation exposure because the UPR and surrounding areas within and around WMA C are paved and any vegetation is (currently) managed using herbicide applications." Speculation on future land use should be deleted.	Future land use is unknown.	Delete this speculation on future land use.	The sentences have been revised as follows: "However, this exceedance is considered of little significance for current vegetation exposure because the UPR and surrounding areas within and around WMA C are paved and any vegetation is (currently) managed using herbicide applications."
BRAF-1	App F and G (added in Rev. 3)	—	—	Several discrepancies were observed between Table 3-15 and 3-16 vs. several corresponding tables in appendices. Also, note that summing all HQs for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism (App G).	Consistency is needed between tables in the main document vs. appendices. Sample HI should be segregated by toxic mechanism.	Resolve the discrepancy for Table 3-15 vs. Table F-3-7. Resolve discrepancies for Table 3-16 vs. several tables in Appendix G (Table G-5-5, Table G-5-8, Table G-5-9, Table G-5-10). Add a note to App G that explains that summing all HQs for a sample to calculate sample HI represents a worst case, since not all COPCs act by the same toxic mechanism.	Tables 3-15 (current Table 3-45) and 3-16 (current Table 3-96) have been updated to address the discrepancies. A footnote has been added to App G (all tables with Attachment G-4 and Attachment G-5) to state the suggested text.
BRAF-2	Appendix F, Appendix G (added in Rev. 3)	Tables F-1-1 through G-5-10	—	There are a lot of blanks for contaminants in these tables, suggesting that some results were omitted from the sample-by-sample approach. This may explain why the statistical approach gave some higher results than the sample-by-sample approach.	For example, Am-241, C-14, Pu isotopes, Se-79, Sr-90, and U isotopes have no values reported for sample B2B1L8.	Please explain these blanks. Where data are available to fill in the blanks, please fill in the blanks and recalculate the sample-by-sample values.	The blank space within those worksheets represent non-availablilty of sample results for the analytes. A footnote has been added to explain that.
BRAH-1	Appendix H (added in Rev. 3)	Table H-1	—	The hexavalent chromium concentration soil to protect groundwater value should be changed to 0.2 mg/kg.	Table 3-14 has a value of 192 ug/kg; this is based on a Kd value of 0 mL/g for Hanford, from PNNL-13895.	Please revised the soil to protect groundwater value to 0.2 mg/kg or 192 ug/kg.	Concur. Appendix H has been updated with the revised soil concentration protective of groundwater value of 0.192 mg/kg for hexavalent chromium.

REFERENCES

10 CFR 20, "Standards for Protection Against Radiation," *Code of Federal Regulations*, as amended.

1221558, 2013, "Issues Associated with Establishing Soil Cleanup Levels for Arsenic" (memorandum from D. Bradley to J. A. Hedges and J. Price, Nuclear Waste Program, June 11), Toxics Cleanup Program, State of Washington Department of Ecology, Olympia, Washington.

16-NWP-130, 2016, "Re: 200-SW-2 Radioactive Landfills Group Operable Unit RCRA Facility Investigation/Corrective Measures Study/Remedial Investigation/Feasibility Study Work Plan, DOE/RL-2004-60, Revision 1" (letter from P. E. Eberlein to R. Corey, Richland Operations Office, U.S. Department of Energy, July 27), State of Washington Department of Ecology, Richland, Washington.

17-NWP-085, 2017, "Re: Department of Ecology's (Ecology) Review and Comments of Appendix 1 Performance Assessment for Waste Management Area C (WMA C) Documents" (external letter from J. J. Lyon to C. J. Kemp, U.S. Department of Energy Office of River Protection, July 14), State of Washington Department of Ecology, Richland, Washington.

59 FR 43200, 1994, "Radiological Criteria for Decommissioning," *Federal Register*, Vol. 59, pp. 43200–43088 (December 9).

62 FR 39058, 1997, "Radiological Criteria for License Termination; Final rule," *Federal Register*, Vol. 62, pp. 39058–39092 (July 21).

Andersson, P., J. Garnier-Laplace, N. A. Beresford, D. Copplestone, B. J. Howard, P. Howe, D. Oughton, P. Whitehouse, 2009, "Protection of the environment from ionising radiation in a regulatory context (PROTECT): proposed numerical benchmark values," *Journal of Environmental Radioactivity*, vol. 100, Issue 12, pp. 1100–1108.

Beresford, N. A., C. L. Barnett, B. J. Howard, W. A. Scott, J. E. Brown, and D. Copplestone, 2008, "Derivation of transfer parameters for use within the ERICA tool and the default concentration ratios for terrestrial biota," *Journal of Environmental Radioactivity*, vol. 99, Issue 9, pp. 1393–1407.

CHPRC-00784, 2014, *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site*, Rev. 1, CH2M HILL Plateau Remediation Company, Richland, Washington.

DOE/EH-0676, 2004, *RESRAD-BIOTA: A Tool for Implementing a Graded Approach to Biota Dose Evaluation, User's Guide, Version 1*, ISCORS Technical Report 2004-02, U.S. Department of Energy, Washington, D.C.

DOE/RL-92-24, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 4, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2009-127, 2011, *Remedial Investigation Report for the 200-BP-5 Groundwater Operable Unit*, Decisional Draft, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2010-96, 2019, *Remedial Investigation/Feasibility Study for the 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2018-69, 2020, *Cumulative Impact Evaluation Technical Approach Document*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-STD-1153-2002, 2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, U.S. Department of Energy, Washington, D.C.

ECF-HANFORD-11-0038, 2012, *Soil Background for Interim Use at the Hanford Site*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-HANFORD-11-0158, 2014, *Tier 2 Terrestrial Plant and Invertebrate Preliminary Remediation Goals (PRGs) for Nonradionuclides for Use at the Hanford Site*, Rev. 1, CH2M HILL Plateau Remediation Company, Richland, Washington.

ECF-HANFORD-14-0056, 2015, *WMA C Nonradiological Human Health Risk Assessment for an Industrial Worker Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0058, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Maintenance/Surveillance Worker Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0061, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Trespasser Adult Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0062, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Trespasser Youth Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0064, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Construction Worker Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0066, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Residential Adult Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

ECF-HANFORD-14-0067, 2015, *WMA C Nonradiological Human Health Risk Assessment for a Residential Child Exposure Scenario*, Rev. 0, INTERA, Inc., Richland, Washington.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order – Tri-Party Agreement*, 2 vols., as amended, State of Washington Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

EPA-402-R-93-081, 1993, *Federal Guidance Report No. 12, External Exposure to Radionuclides in Air, Water, and Soil*, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C.

EPA 402-R-99-001, 1999, *Cancer Risk Coefficients for Environmental Exposure to Radionuclides*, Federal Guidance Report No. 13, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C.

EPA-520/1-88-020, 1988, *Limiting Values of Radionuclide Intake And Air Concentration and Dose Conversion Factors For Inhalation, Submersion, And Ingestion*, Federal Guidance Report No. 11, Office of Radiation Programs, U.S. Environmental Protection Agency, Washington, D.C.

EPA/540/1-89/002, 1989, *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A) Interim Final*, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

HNF-SD-WM-TI-707, 2007, *Exposure Scenarios and Unit Factors for the Hanford Tank Waste Performance Assessment*, Rev. 5, CH2M HILL Hanford Group, Inc., Richland, Washington.

IAMIT Determination 2019-006, 2019, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Judgmental Sample Analysis*, Hanford Federal Facility Agreement and Consent Order Interagency Management Integration Team, Richland, Washington.

IAMIT Determination 2019-007, 2019, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Groundwater*, Hanford Federal Facility Agreement and Consent Order Interagency Management Integration Team, Richland, Washington.

IAMIT Determination 2019-008, 2019, *Baseline Risk Assessment (BRA) for Waste Management Area C (WMA C) – Food Chain Pathway*, Hanford Federal Facility Agreement and Consent Order Interagency Management Integration Team, Richland, Washington.

ICRP 38, 1983, "Radionuclide Transformations - Energy and Intensity of Emissions," *Annals of the ICRP*, International Commission on Radiation Protection, Vol. 10, No. 4.

ICRP, 2008, "ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations," *Annals of the ICRP*, International Commission on Radiation Protection, Vol. 38, No. 3, pp. 7–96.

Miller, G. W., 2015, "Society of Toxicology Board of Publications Best Paper Award for 2015," *Toxicological Sciences*, vol. 144, Issue 2, pp. 206–207.

OSWER 9285.6-10, 2002, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.

OSWER Publication 9285.7-08I, 1992, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

PNNL-13895, 2003, *Hanford Contaminant Distribution Coefficient Database and Users Guide*, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

RPP-CALC-61128, 2016, *WMA C Ecological Risk Assessment for UPRs, Surface Contamination and 216-C-8 French Drain*, Rev. 1, INTERA, Inc. prepared for Washington River Protection Solutions, LLC, Richland, Washington.

RPP-CALC-61238, 2020, *Radiological Risk Assessments for Three Unplanned Releases Within Wast Management Area C*, Rev. 0, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-ENV-58813, 2016, *Exposure Scenarios for Risk and Performance Assessments in Tank Farms at the Hanford Site, Washington*, Rev. 0, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-PLAN-38777, 2012, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 3, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-47479, 2011, *Exposure Scenarios for the Waste Management Area C Performance Assessment*, Rev. 1, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-57218, 2014, *Computation of Exposure Point Concentrations for Waste Management Area C Phase 2 Soil Characterization Data*, Rev. 0, INTERA, Inc./Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-58329, 2016, *Baseline Risk Assessment for Waste Management Area C*, Rev. 2, INTERA, Inc./CH2M HILL Plateau Remediation Company/Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-58339, 2016, *Phase 2 RCRA Facility Investigation Report for Waste Management Area C*, Rev. 0, Washington River Protection Solutions, LLC/Freestone Environmental, Inc./TerraGraphics Environmental Engineering, Inc., Richland, Washington.

RPP-RPT-59197, 2016, *Analysis of Past Tank Waste Leaks and Losses in the Vicinity of Waste Management Area C at the Hanford Site, Southeast Washington*, Rev. 0, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-59379, 2016, *Waste Management Area C Phase 2 Corrective Measures Study Report*, Rev. 0, Washington River Protection Solutions, LLC/Freestone Environmental, Inc./ Columbia-Energy and Environmental Services, Inc., Richland, Washington.

Sheppard, S. C., M. I. Sheppard, M-O. Gallerand, and B. Sanipelli, 2005, "Derivation of ecotoxicity thresholds for uranium," *Journal of Environmental Radioactivity*, vol. 79, Issue 1, pp. 55–83.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-303-610, "Closure and Post-Closure," *Washington Administrative Code*, as amended.

WAC 173-340-700, "Overview of Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-709, "Methods for Defining Background Concentrations," *Washington Administrative Code*, as amended.

WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties," *Washington Administrative Code*, as amended.

WAC 173-340-760, "Sediment Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-720, "Groundwater Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-740, "Unrestricted Land Use Soil Cleanup Standards," *Washington Administrative Code*, as amended.

WAC 173-340-7490, "Terrestrial Ecological Evaluation Procedures," *Washington Administrative Code*, as amended.